HELSINKI SCHOOL OF ECONOMICS (HSE)
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PRIVATE EQUITY SECONDARY SALES

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HELSINKI SCHOOL OF ECONOMICS **ABSTRACT**

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Lauri Lampi

PRIVATE EQUITY SECONDARY SALES

Objectives: The objective of this study is to gauge knowledge on rationales behind private equity secondary sales. The study examines 81 private equity secondary sales occurring between 1980 and 2006. The main interests of the study concern the fund characteristics of sellers and acquirers. In addition, the study aims at finding out which factors affect the probability of a secondary sale.

Data: The analysis is carried out by analyzing 81 secondary sales involving 104 selling and 80 acquiring private equity funds. 1135 other private equity funds act as a peer group representing the universe of private equity funds. All the data used in this study are from SDC Platinum™ VentureXpert and Mergers and Acquisitions subdatabases.

Methodology: The analysis consists of comparing sellers' and acquirers' fund characteristics. Differences in mean values are revealed by using student's *t*-test. Estimating the probability of a transaction and the impact of individual variables is done by employing a logistic regression model. The model considers attributes of selling funds and compares them to attributes of other private equity funds. The purpose of this examination is to study whether selling funds have some common characteristics that may increase the probability of a secondary sale.

Results: The results indicate that most of the secondary sales take place between buyout funds. Thus, the probability of a secondary sale increases if the selling fund is a buyout fund. Selling funds have on average significantly longer investment period than acquirers or other funds, and extending the investment period appears to have a significant positive impact on the probability of a secondary sale. Selling funds are dominantly follow-on funds, which implies that conducting secondary sales does not necessarily relate to underperformance of sellers. The sequence numbers do not seem to gain explanatory power indicating that, in the light of these results, experience or inexperience does not explain the occurrence of secondary sales. The findings suggest that acquiring funds are significantly larger than selling funds. Increasing the fund size seems to increase rotation, and moreover, the probability of a secondary sale. The sellers are also evidenced to finance significantly larger number of portfolio companies indicating that increasing the number of portfolio companies, increases the probability of a secondary sale as well. Additionally, acquirers seem to make significantly larger average round investments than other funds. For both, sellers and acquirers, firm reported capital under management is significantly larger than for other funds. Firm reported capital under management does not differ significantly between acquirers and sellers. Selling funds appear to be significantly older than acquiring funds at the moment of a transaction. The industry focus of selling and acquiring funds is found to be similar. Obtained results suggest that smaller buyout funds raise the portfolio to a certain stage and then a larger fund takes the company to the next stage.

Key Terms: private equity, staged financing, exit vehicle, secondary sale, fund.

HELSINGIN KAUPPAKORKEAKOULU **TIIVISTELMÄ**

Rahoituksen Pro Gradu-Tutkielma 9.5.2007
Lauri Lampi

PRIVATE EQUITY SECONDARY SALES

Tavoitteet: Tämän tutkielman tavoitteena on lisätä ymmärrystä pääomasijoittajien välisistä portfolioyritysten myynneistä. Tutkielman tarkastelun kohteena on 81 pääomasijoittajien välistä yrityskauppaa vuosien 1980 ja 2006 välillä. Tutkielma keskittyy pääosin myyvien ja ostavien pääomasijoitusrahastojen ominaisuuksien tutkimiseen. Lisäksi pyritään löytämään tekijöitä, jotka lisäävät pääomasijoittajien välisten yrityskauppojen todennäköisyyttä.

Data: Analyysi perustuu 81:een pääomasijoittajien väliseen yrityskauppaan, joissa on ollut mukana 104 myyvää ja 80 ostavaa pääomasijoitusrahastoa. Vertailuryhmä käsittää 1135 muuta pääomasijoitusrahastoa. Kaikki tutkielmassa käytetty data on SDC Platinum™ VentureXpert ja Mergers and Acquisitions tietokannoista.

Metodologia: Analyysi perustuu myyvien ja ostavien pääomasijoitusrahastojen ominaisuuksien vertailuun. Erot joukkojen keskiarvoissa on mitattu käyttäen Studentin *t*-testiä. Yrityskaupan todennäköisyyden ja yksittäisten muuttujien vaikutuksen arviointiin on käytetty logistista regressiomallia. Malli huomioi myyvän pääomasijoitusrahaston ominaisuudet ja vertaa niitä vertailuryhmän rahastojen ominaisuuksiin. Analyysin tavoitteena on tutkia, onko myyvillä rahastoilla yhteisiä tekijöitä, jotka nostaisivat pääomasijoittajien välisten kauppojen todennäköisyyttä.

Tulokset: Tulokset viittaavat siihen, että tutkimuksen kohteena olevat transaktiot tapahtuvat pääasiallisesti buyout-rahastojen välillä, joten transaktioiden todennäköisyys nousee mikäli myyjä on buyout-rahasto. Myyvien rahastojen keskimääräistä pidempi investointiaika näyttäisi nostavan tutkittujen transaktioiden todennäköisyyttä. Myyvät rahastot ovat pääosin follow-on rahastoja, mikä viittaa siihen, että tutkittujen transaktioiden tapahtuminen ei välttämättä liity myyjien huonoon menestykseen. Rahastojen järjestysnumerot eivät tue olettamusta, että myyvät pääomasijoittajat ovat kokemattomia. Aineiston ostajat ovat merkittävästi suurempia kuin myyjät. Rahaston koon kasvattaminen näyttää lisäävän kiertoa ja näin ollen nostavan myös tutkittujen transaktioiden todennäköisyyttä. Tulokset myös osoittavat, että myyjät rahoittavat keskimäärin suurempaa määrää portfolioyrityksiä, mikä viittaa siihen, että portfolioyritysten määrän kasvattaminen lisää tutkittujen transaktioiden todennäköisyyttä. Lisäksi ostajat näyttäisivät tekevän keskimäärin merkittävästi suurempia sijoituksia kuin muut rahastot. Sekä myyjien että ostajien hallinnoitavissa oleva pääoma havaitaan merkittävästi suuremmaksi kuin alalla keskimäärin, mutta pääoman määrä ei eroa merkittävästi myyjien ja ostajien välillä. Myyvät rahastot näyttävät olevan yrityskaupan hetkellä merkittävästi vanhempia kuin ostajat. Myyjien ja ostajien toimialafokus on havaintoaineiston mukaan samanlainen. Tutkimuksen tulokset viittaavat siihen, että pienemmät buyout-rahastot kasvattavat portfolioyrityksen tietylle tasolle, minkä jälkeen suurempi buyout-rahasto jatkaa yrityksen kehittämistä seuraavalle tasolle.

Avainsanat: pääomasijoittaminen, vaiheittainen rahoitus, irtautumismenetelmä, keskinäinen yrityskauppa, rahasto.

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1. Introduction

The continuously growing and developing private equity industry has become an essential part of economy. This has increased the amount of private equity related academic research as well. However, as the field of research is still relatively young and fragmented, there still remains plenty of room for academic research. In addition to performance, portfolio composition, contracting, and informational asymmetries related studies, different exit vehicles have gained scholars' attention. Most of these studies focus on tempting features of initial public offerings while other exit vehicles, such as acquisitions, secondary sales, and buybacks, have gained less attention. Especially the amount of private equity secondary sales has recently increased considerably. However, there is little knowledge on rationales behind secondary sales.

1.1. Background and Motivation

Private equity industry has become an important source of financing for various companies and projects. Companies may have good and extremely profitable ideas but may have limited access to traditional sources of capital. These companies and projects are today often financed by private equity investors. Many widely recognized companies, such as Microsoft, Oracle, Compaq, and Sun Microsystems, have also received private equity financing at some stage of their life.

The growth and development of private equity industry has increased the amount of related academic research during the last fifteen years. Many of the prior studies have concentrated on risk and return profiles of venture capital investments or on comparing private equity investments to other asset classes (see e.g. Chiampou and Kallett 1989; Ruhnka and Young 1991; Gompers and Lerner 1999a, 1999c, 1999d; Ljungvist and Richardson 2003 etc.). Other previously conducted studies related to portfolio composition are dominantly theoretical models attempting to optimize the composition of a venture capitalist's portfolio (see e.g.

Kanniainen and Keuschnigg 2003; Fulghieri and Sevilir 2005; Bernile, Cumming, and Lyandres 2005; Cumming 2006 etc.). In addition, topics such as informational asymmetries, financial contracting and capital raising have gained attention. National Venture Capital Association (NVCA) and European Venture Capital Association (EVCA) represent practioners' viewpoint of the industry by publishing annual surveys and industry statistics.

According to the traditional understanding of private equity investing, private equity investors finance and advice companies and then exit investments by selling their stakes to public markets or to strategic buyers. Although exit vehicles, such as initial public offerings and trade sales, have gained popularity as research topics, very little research on private equity secondary sales exists. A private equity secondary sale refers to a transaction where one private equity investor sells a portfolio company to another private equity investor.

The secondary market for private equity investments has been virtually nonexistent until the end of the previous century. Traditionally, selling a portfolio company to another private equity investor has not been considered as a viable exit route. However, the increase in the amount of secondary sales in recent years cannot be neglected. Consequently, we already understand some fundamentals of private equity investing, but we know very little about the reasons behind secondary sales.

1.2. Research Problem and Objectives

This study attempts to shed light on secondary sales. The main objective of the study is to gauge knowledge on why a private equity investor sells a portfolio company to another private equity investor. I assume that the initial purpose of the fund is not to sell holdings to other private equity investors. Instead, I assume that a private equity investor aims at exiting investments through exit routes that have traditionally been considered as the most profitable (e.g. initial public offerings and trade sales).

This study examines 81 private equity secondary sales occurring between 1980 and 2006. The main interests of the study concern the fund characteristics of sellers and acquirers.

The research problem can be formulated as follows:

Why do secondary sales occur, and which fund specific characteristics increase the probability of a secondary sale?

The study aims at finding rationales behind secondary sales by analyzing the characteristics of selling and acquiring funds. The empirical examination consists of evaluating selling and acquiring funds' investment period, fund type, fund investment type, stage focus, fund size, number of portfolio companies, average round investment, private equity company's capital under management, age at the time of transaction, and industry focus. In addition, the study attempts to reveal which fund characteristics affect the probability of a secondary sale. I evaluate the factors affecting probability by running a logistic regression model and by interpreting the coefficients and odds ratios of individual variables.

1.3. Structure of the Study

This thesis is organized as follows. Chapter 2 gives an overview of private equity investing and reviews the recent developments in the field. Thereafter, Chapter 3 reviews prior studies and related theory. The research question and the hypotheses are formulated in Chapter 4 while Chapter 5 describes the data used in this study. Chapter 6 presents descriptive analysis and the results of the empirical examination. Finally, Chapter 7 concludes and presents suggestions for further studies.

2. Fundamentals of Private Equity

This chapter provides an overview of private equity industry. The chapter first briefly reviews the history of private equity and then describes the typical private equity investment cycle and the concept of staged financing. The concept of staged financing is related to risk and reward relationships of private equity investments and is therefore crucial in terms of understanding the investing process. The chapter also sheds light on various different private equity investments. Finally, the chapter presents recent developments in the industry and describes secondary sales as an exit vehicle.

2.1. History of Private Equity Investing

Entrepreneurs have long required capital for implementing their ideas but may have lacked the funds to finance these projects by themselves. Moreover, some of these entrepreneurs have been unable to tap more traditional sources of external financing such as bank lending. Start-up companies often lack tangible assets, have expected several years of negative earnings, have uncertain prospects, and are thus obliged to find alternatives for traditional financing. Private equity investors, and more specifically venture capitalists, represent one solution to this problem. The first indications about the presence of venture capitalists date back to at least as far as Babylonian partnerships at the time of Hammurabi (Lutz 1932). Another often referred case of private equity financing is Queen Elisabeth of Spain financing Christopher Columbus in 1400s (Smith and Smith 2000).

The private equity industry itself is still relatively young. The modern era of private equity investing did not begin until the end of World War II, when the first venture capital companies, such as American Research and Development (1946) and in Europe 3i (1945), were established as closed-end mutual funds. 3i, which was originally named "the Industrial and Commercial Finance Corporation", was founded by UK clearing banks and the Bank of England to meet the needs of smaller companies and to address the shortage of long term

capital available to them for development. American Research and Development (ARD) then again was founded to commercialize new technologies that had been developed during the war by raising institutional capital using a publicly traded closed-end investment company.

Fund flowing into the private equity industry increased dramatically during the late 1970s and early 1980s. During this period, private equity investing took a giant step towards what it is nowadays. In the UK, regulation changes and the move towards the Competition and Credit Control Policy in the early 1970s gave banks greater flexibility in selecting investments. In the US, the clarification of the "Prudent Man" rule in 1978 relaxed many of the limitations placed on pension funds. Prior to that date pension funds were prohibited from investing substantial amounts of money in venture capital or other high-risk asset classes.

In addition, during the 1980s the importance of role of investment advisors increased considerably. Before that, investors invested directly in venture funds, but because these investments were just a little portion of their portfolios, not much resources were devoted to monitoring and evaluating these investments. Then during the mid-1980s, investment advisors entered the market, and by the 1990s, one-third of all pension fund commitments in the US was made through an investment advisor. Another considerable development was the rise of limited partnership as the dominant organizational form. The phrase "private equity" only became widespread in the late 1980s following public interest in Leveraged Buyout (LBO) activity that took place particularly in the US. (Gompers and Lerner 1999a)

In the end of 1980s, returns of the funds declined due to overinvesting and the entry of inexperienced investors. However, the activity in the initial public offering (IPO henceforward) market and exit of these inexperienced investors led to an increase in returns and capital commitments again around mid 1990s (Gompers and Lerner 1999a). In the early 1990s, the industry began a period of drastic international growth and the amount of new commitments more than tripled between 1991 and 1995. Additionally, the switch from fixed income assets into equity and equity linked assets in the late 1990s was a driver for the growth of the industry. (Gompers and Lerner 1999d)

Private equity industry boomed along with the development of technology and the surge of stock market at the end of 1990s, but the returns, investments, and the amount of raised funds

plummeted along with overall economic downturn in the beginning of the 21st century. According to the European Venture Capital Association (EVCA), the period culminated in over 200€ billion being raised globally in 2000 by private equity funds. The average fund size in the US, which has been the largest private equity market, almost tripled between 1992 and 2002, amounting to around $140 million. This was also accelerated by the increase of the number of larger funds. (Baygan 2004)

Many studies (see eg. Gompers and Lerner 1999b; Jeng and Wells 2000; Cumming, Fleming, and Schwienbacher 2003) show that, as can be expected, private equity investments' exit conditions largely depend on the current state of stock markets as well as overall macroeconomic conditions. During the bubble period at the end of 1990s, when valuations reached historical highs, the financial markets were very attractive, and thus new offerings were easy to sell. Correspondingly, exiting investments was relatively easy during that period and apparently many portfolio companies and especially small IT and high-tech companies went public despite having dubious business and being highly unprofitable. (Cassidy 2002; Giot and Scwienbacher 2004).

The rapid development of technologies in the 1990s made the role of small technology-oriented companies more important. This was particularly the case in the field of information and communication technologies and health-related sectors, including biotechnology. Overall, private equity experienced a significant growth in countries where the shift from traditional sectors to high-technology manufacturing and services accelerated in the late 1990s.

The development has not been similar everywhere. In the US, where the stock market can be considered very efficient and the IPO market active, the private equity market has consisted of financing young and early-stage companies. In contrast in Europe, which has been a very bank-centered market, the investments have been made to later stage and usually non-technology intensive companies. This explains why buyouts as exits are more common to the European private equity market. In the US, most of the capital has been provided by pension funds while in the Europe, banks have traditionally been the main source of funds (Black and Gilson 1999). Same differences are also discussed in Schwienbacher's (2002) study. The illiquidity of the European market tends to extend selling periods compared to a more liquid US-market. However, Schwienbacher points out that there are signs of convergence of the

two markets. Hege et al. (2006) conducted a comparative study the results of which reveal that US venture capitalists outperform their European counterparts. US venture capitalists tend to use convertible securities more frequently and use other instruments to control and contingent funding efficiently. In addition, they point out that performance reacts positively to shorter funding intervals in the US while the opposite holds primarily for Europeans. US venture capitalists use more syndication, which also seems to contribute positively to performance. It also appears that US-based venture capitalists' behavior is more consistent and more aligned with the theory. On the contrary European venture capitalists on the contrary can be argued to behave inconsistently. Inconsistent behavior indicates that US venture capitalists are still more sophisticated than Europeans.

2.2. Concepts of Private Equity Investing

2.2.1. Definitions

There seems to be no generally accepted definition for private equity. For example, in the US academicians and practioners make clear distinction between private equity and venture capital, and venture capital is treated as a subset of private equity. In general, private equity investments can be divided into three categories, which are venture capital, buyouts and mezzanine. However, especially in Europe, buyouts and mezzanine financing are often defined under venture capital, and thus venture capital is a synonym for private equity. Throughout this study I will use the US definition of private equity.

Venture Capital. Investing in immature, high growth, and risky companies that need capital to finance product development and/or growth (Black and Gilson 1999). In Europe, the concept of venture capital often includes buyouts and mezzanine-financing. In this study, all three types are defined under private equity. This is also the EVCA's definition of Private Equity.

Buyout. EVCA defines a buyout fund as a fund that typically targets the acquisition of a significant portion or majority control of businesses which normally entails a change of ownership. Buyout funds normally invest in more mature companies with established plans or potential for development. However, investment strategies can vary widely, ranging from growth to value and from early to later stage. Funds may either take an active or a passive management role. Durations of investments can also be very short.

Mezzanine. Mezzanine funds usually finance companies in special situations. Investing ranges broadly including distressed debt, equity-linked debt, project finance and for example one-time opportunities resulting from changing business environment or government regulations. This category also includes investment in subordinated debt, sometimes referred as mezzanine debt financing, where the debt-holder seeks equity appreciation via such conversion features as rights, warrants, or options.

Fund. An investment vehicle in which investors commit capital and from which private equity fund managers invest in portfolio companies. A private equity company typically raises a fund every two to five years.

Private Equity/Venture Capital Company. These companies manage private equity portfolios and invest capital from funds. Funds are often named according to the company managing them (e.g. Landmark Equity Partners I, Landmark Equity Partners II etc.)

Portfolio Company. The companies a private equity fund has invested in are called portfolio companies as they belong to a private equity investor's portfolio.

Fundraising. Refers to a process in which a private equity company raises capital from investors to be invested in companies.

Disbursements. The private equity company selects the companies to be invested in and then invests capital from the raised private equity fund in the selected company.

Staged Investments. Private equity investments are often divided into stages according to the maturity of portfolio companies' businesses. Names of the stages may vary, but the concept is the same. Venture Economics categorize stages as follows: seed, start-up, early-stage, first

stage, other early, expansion, second stage, third stage, and bridge, while EVCA refers to seed, start-up, expansion, replacement, and buyout.

2.2.2. Structure of the Industry

Fenn, Liang, and Prowse (1998) provide a relatively detailed overview of the private equity industry. The authors subdivide the industry into two segments: the organized private equity segment and the informal private equity segment. The organized private equity segment consists of three major groups. The first group consists of *issuers* who are new ventures, financially distressed companies, and other companies. The second group includes *investors* who are insurance companies, investment banks, pension funds, wealthy families and other who may consider private equity as a viable asset class. *Intermediaries* are the third group, and they manage the investments between issuers and investors. The informal private equity segment encompasses all other segments not included in the organized private equity segment. This segment includes for example angel investing. Angel investing is often considered a critical source of seed financing. However, observing angel investing is nearly impossible, since private investors are reluctant to disclose any information.

2.2.3. Investing Process

Private equity investors do not typically raise capital on a continual basis but rather through periodic funds. These funds are usually in the form of limited partnerships and have a fixed life of around ten years. However, extensions of a couple of years are possible and not even rare. After the fund is closed, the funds must be returned to those who invested in the fund. Usually, the private equity company intends to raise a new fund after the first one is closed down. The private equity company's role is to manage the fund and review the proposed investments. The investors act as limited partners by investing in the fund. They monitor the progress of the fund by attending the annual meeting but cannot be involved with the day to day management.

The following figure describes the process of private equity investing.

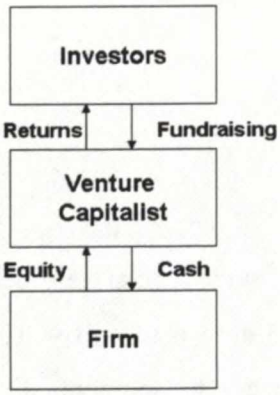

Figure 1. An overview of the private equity capital process (Gompers and Lerner 1999a)

One central feature of private equity investing is that when the decision to invest is made, the disbursements are usually made in stages. This forces managers of portfolio companies to return repeatedly to their financiers for additional capital. The following figure shows how different stages of business development relate to a risk level and to return on investment.

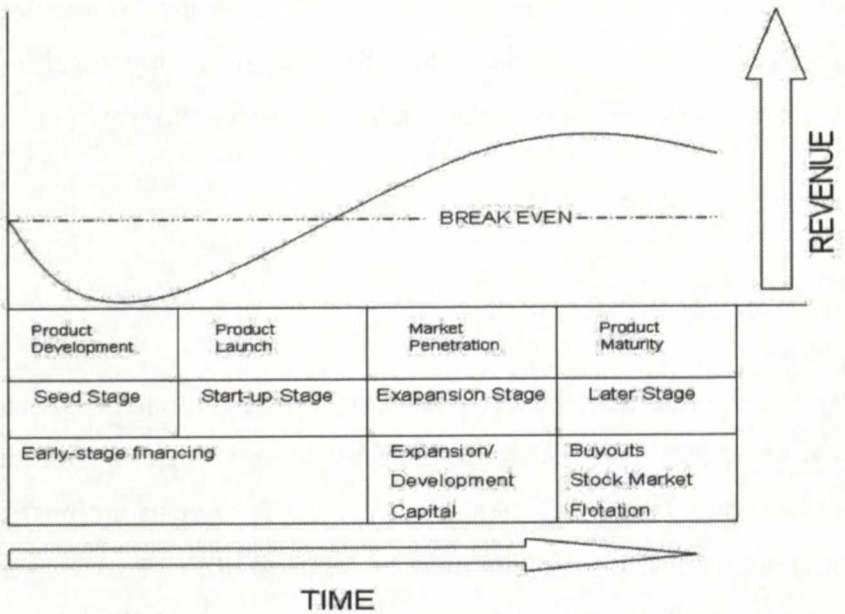

Figure 2. Different stages of venture capital investments (EVCA 2002)

The curve above is often referred among practioners as the "j-curve". The time period before the break even point is referred as "the valley of death" because it is the period during which the company will have to turn the operations profitable in order to continue doing business.

Private equity investors also cooperate with each other, and portfolio companies are often financed by a syndicate formed by a number of private equity investors. Syndication gives private equity investors an opportunity for "double-checking" their ideas as projects are reviewed by a number of other investors as well.

2.2.4. Structure of a Fund

Most of the private equity funds, even though not all, are structured as *limited partnerships*. The first venture capital limited partnership was founded in 1958, but the structure did not gain popularity until the late 1970s. Since those days the number of limited partnerships has been estimated to amount to over 80% of all private equity funds (Gompers and Lerner 1999a).

Typically, a fund is structured as follows. A fund has a fixed life typically around eight to ten years with a predetermined closing date. However, extensions in a fund's lifetime are possible. The private equity company manages the fund and thus acts as a *general partner*. The investors investing in the fund act as *limited partners*. The main task of a general partner is to manage the fund and to decide on the investments, while the main role of limited partners is to provide funding. A general partner typically provides around 1-2% of committed capital and limited partners provide the rest. As a compensation for the fund management, a private equity company receives 2-3% annual fee plus 20-30% of realized returns. The rest is left for limited partners. (Gompers and Lerner 1999a). In addition, there exists a group of investment advisors that are often referred to as "*gatekeepers*". Investment advisors may raise capital for funds and/or evaluate potential venture funds on behalf of investors. As I already discussed, by the 1990s, one-third of all pension fund commitments in the US was made through an investment advisor. Investment advisors make the industry more transparent as they reduce costs associated with informational asymmetries related to private equity investing.

In order to prevent fund managers from taking undesirable actions or from making unnecessary risky investments, various covenants are usually included in partnership

agreements. The covenants protect limited partners' interests as they are unable to monitor general partners' daily actions. General partners might be tempted to exhibit opportunistic behavior.

In Europe, there also exist a great number of so called captive funds which refer to a fund that receives over 80% of committed capital from a single source. These funds are usually banks' subsidiaries. In the US, captive funds have not gained equal prevalence as in Europe. (Jeng and Wells 2000)

2.2.5. Sources of Private Equity Finance

The investors committing capital to private equity funds include pension funds, banks, fund of funds, insurance companies, government agencies, wealthy private individuals, corporations, academic institutions, and other that consider private equity as a relevant asset class to be invested in.

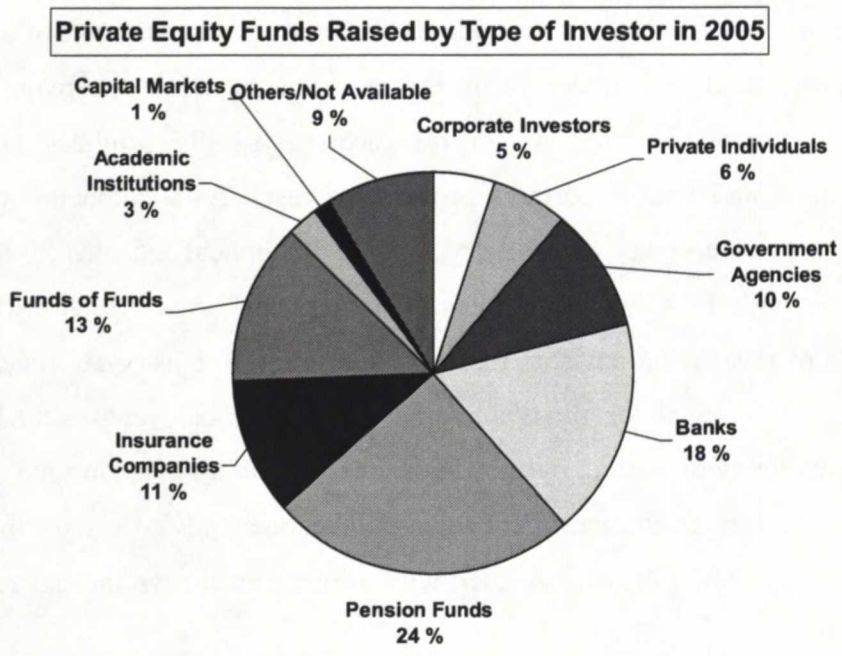

Figure 3. Sources of European private equity (EVCA/Thomson Financial)

The figure above describes distribution of sources of European Private Equity.

Bank backed funds seem to be more focused on later stage financing, while individual and institutional backed funds seem to focus more on early-stage financing. This is reflected in geographical differences in investment focus. For example in the United Kingdom, where financial institutions and pension funds are main source of funds, the focus is more on later stage investments. Same holds in another bank oriented market, Germany. Then again in Israel, where funds come in larger scale from individuals and corporations, the focus in more on early-stage and seed-level investments. (Mayer, Schoors, and Yafeh 2005)

2.2.6. Exit Vehicles

Private equity investors also manage the exiting of investments. Typically, private equity investors have sought to take the most promising companies public. Other less successful firms are liquidated, sold to strategic acquirers, or they remain operational at a modest level of activity. In addition, some companies are sold to the managers of companies or to other private equity investors. Cumming and MacIntosh (2001a) report five typical exit vehicles: initial public offerings, acquisitions, buybacks, secondary sales, and write-offs.

In an *IPO*, the private equity investor sells a portfolio company to public investors. The private equity investor will not usually sell all his holdings into the public market at the time of the offering, but rather the securities will be sold over a period of months or even years following the offering. Traditionally, an IPO has been considered to be the most lucrative and profitable exit method (Cumming and MacIntosh 2002; Giot and Schwienbacher 2004; Torstila and Laine 2005 etc.).

In an *acquisition* the portfolio company is purchased entirely by a third party. Acquisitions come in many forms including mergers, sales of assets, and sales of shares. In the majority of cases the buyer is a strategic acquirer. A strategic acquirer operates in the same business as the target company. The acquirer may be a competitor, a supplier, or a customer of the target, the acquirer is usually much larger than the target. The target will continue as a subsidiary or will be merged to the acquirer.

In some cases, the acquirer may be another private equity investor. These acquisitions are called *secondary sales*. These transactions differ from abovementioned acquisitions in that only the private equity company will sell its shares, while the entrepreneur and other investors often retain their shares. Secondary sales are often called secondary buyouts.

In *buybacks* the entrepreneur repurchases the shares from the private equity company. In many cases, buybacks are triggered by the exercise of contractual rights taken by the private equity company at the time of an initial investment.

A *write-off* occurs when the private equity company walks away from its investment. While a write-off usually involves a failure of the portfolio company, the private equity fund may continue to hold shares in a non-viable or barely profitable company.

2.3. Recent Developments in the Private Equity Industry

Despite considerable growth of private equity activity in the past decade, the share of start-up and early-stage financing has remained insignificant in many OECD countries. The global downturn in technology and financial markets after millennium has led to more conservative investment stance. Volatility in global financial markets since 2000 has exacerbated the weak performance and further diminished the credibility of public equity markets as a viable exit route. Acquisitions, buybacks, buyouts, and secondary sales have become more common. (Baygan 2004)

Jeng and Wells (2000) have showed that venture capital and especially early-stage financing, has been dominantly driven by IPO market activity. In fact, Romain and Van Pottelsberghe de la Potterie (2004) show that private equity markets are proactive in the sense that fund raising outperforms GDP growth and vice versa. They also show that the level of interest rates has significant impact on private equity intensity. This means that investors usually shift to later stage transactions when overall economic conditions and especially IPO activity slow down.

The following figure shows the development of private equity fund raising between 1998 and 2004. The impact of the economic downturn on fundraising can be seen in the figure.

Fundraising dropped and there was a shift to later stage investments and more specifically to buyouts. Fundraising has picked up again after year 2003. However, this has not led to a considerable increase in early-stage financing as buyout activity has gained most of the attention.

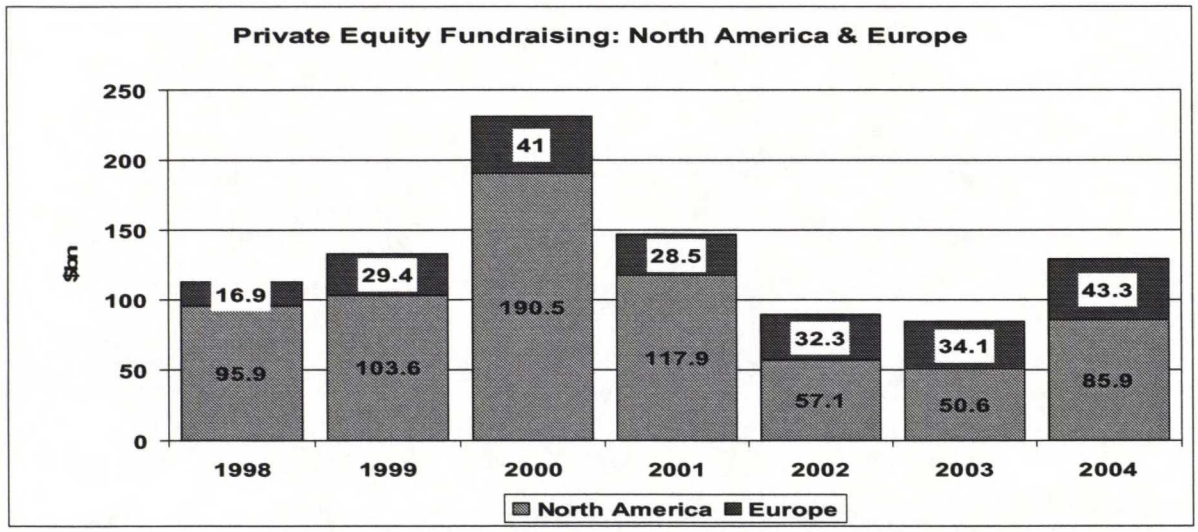

Figure 4. Private equity fundraising in Europe and North America (Venture Economics, EVCA yearbook 2004)

Due to the cyclicality of exit conditions, private equity investors have to consider carefully the timing of exits. The period of the IT-bubble was characterized by easy exits for venture capitalists because there was demand for new public offerings. Nevertheless, after 2001 conditions changed considerably as major stock indices and Nasdaq collapsed. The demand for newly issued equity plummeted, and venture capitalists began to face challenges in exiting portfolio companies. This showed that venture capitalists' performance depends heavily on the conditions of exit-markets. (Giot and Schwienbacher 2004) Since selling a company to the public has not been an option, mergers and acquisitions (M&A henceforward) and their various forms (including secondary sales) have become the most common exit vehicles.

After the bursting of the IT-bubble, the amount of buyouts has increased to considerable levels. According to Thomson Venture Economics, buyouts represent today over 50% of the money invested in private equity in the US and around 70% in Europe. The following figure indicates the post millennium surge in the value of buyouts in North America and Europe.

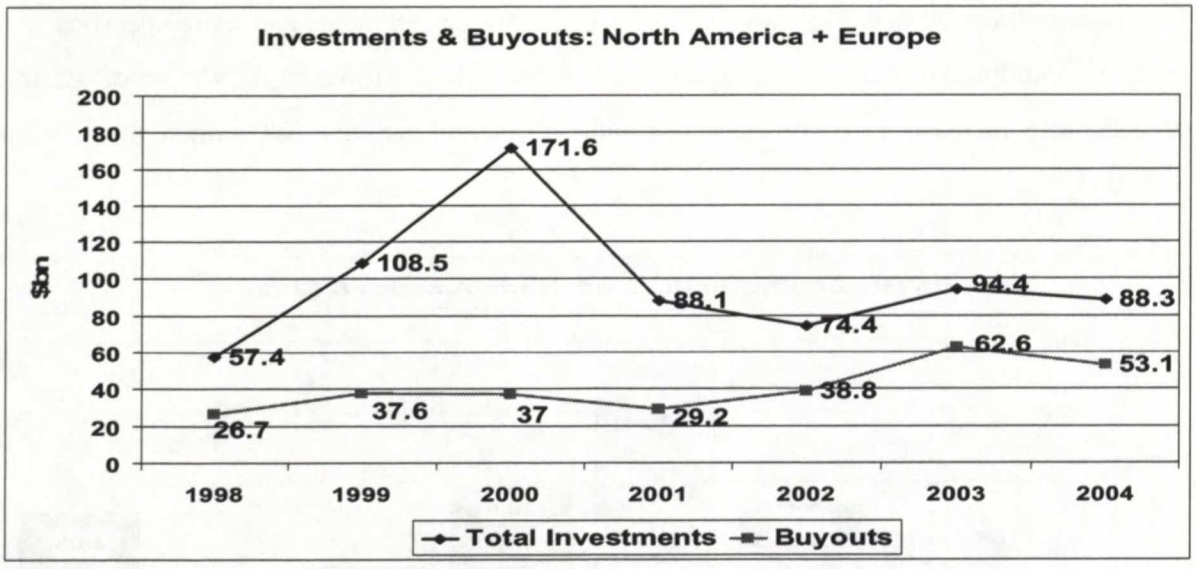

Figure 5. Total investments and buyouts in North America and Europe (Venture Economics, EVCA yearbook 2004)

It can be said that venture capitalists' and buyout funds' way to make money is distinctively different. While venture capitalists mainly invest equity in the longer term, buyout funds and especially LBO funds use leverage to make money. Buyout funds may also use so called platform companies to which other acquired companies are added. Buyout funds' investment durations are usually considerably lower, meaning that their holding period often ranges from three to five years. As capital markets have evidenced an era of historically low interest rates combined with strong economic growth, it is not surprising that accelerated fundraising has resulted in larger funds and increased activity in buyout markets. Therefore, it can be argued that investors are fueling the buyout activity by pouring more money into funds. (Vanac 2006)

One probable reason behind buyouts is target companies' laziness in investing in their businesses. This has resulted in larger buildups of cash in the target companies. Hence, private equity funds consider these kinds of companies as tempting targets. After a couple of years, the target may be intended to be sold back to the market with a profit. Large cash reserves allow for leveraging and paying dividends. With paid dividends and fees the private equity fund can guarantee a high internal rate of return already before exiting the investment. (Trumbull 2006)

Buyouts have occasionally gained negative attention as the public has often questioned the benefits to the surrounding economy. Buyout specialists have been accused for asset stripping as they often dispose unprofitable parts and try to improve operational efficiency of the target by restructuring and laying off people. Much of criticism has been presented by trade union leaders and politicians. (Werdigier 2007)

To sum up, recent cyclicality in the markets and increasing market concentration in the beginning of the decade have raised concerns about a potential equity gap in early-stage financing. Increasing deal size may affect negatively the availability of capital for small companies as they only need relatively small infusions. At the same time, these are the companies that require high due diligence. The OECD sees that funds and deal sizes will probably keep growing and become prevalent as private equity companies and funds establish reliable track records. Private equity will probably attract more diversified sources of funds, especially from large institutional investors. This kind of development might adversely affect the availability of capital for smaller and immature companies. (Baygan 2004) Traditional venture capital investing probably remains as an essential part of the private equity food chain, but the growth will be primarily driven by large buyout specialists.

2.4. Secondary Sales

As described above, private equity secondary sales, or secondary buyouts, refer to transactions in which a private equity investor sells its holdings in a portfolio company to another private equity investor. To prevent any misconceptions, I want to point out that a secondary sale in private equity context can also refer to a situation in which an investor, who acts as a limited partner (LP) in a private equity fund, sells his LP-interest to another investor who then becomes the new limited partner. This kind of a secondary sale is related to secondary market of LP-interests, which again may have nothing to do with the actual investments of private equity funds. In this thesis, I focus on the secondary sales of actual portfolio companies in which private equity investors have invested. The secondary sales of LP-interests are out of the scope of this study.

The secondary market for private equity investments has existed since 1980s, but until the beginning 21st century, it has kept a somewhat low profile in the private equity community. The first secondary sales were made in the mid-80s. These were one-off dealings that took place irregularly. The economic downturn of the early 1990s, which affected private equity investing and fundraising, increased also the number of secondary sales as buyers were able to buy assets at depressed values. Many companies that specialized in buying assets from other private equity investors entered the market. As the private equity market surged in the mid and late 1990s, the number of such investors increased. The subsequent economic downturn hit also private equity industry, and consequently valuations plummeted. (Lee 2003)

In the past, secondary sales have often been classified as a taboo. Secondary sales have been traditionally associated with a situation in which the seller needs to exit an investment but no strategic buyers exist in the market. Thus, the seller has no other opportunities than to sell to a financial buyer. (INVESCO 2004) Therefore, secondary sales have been said to have a taste of failure (Sheahan 2005).

Traditionally, venture capital and other private equity investments were not designed to be resold in the secondary market like other financial assets. As I already discussed above, a private equity portfolio typically has a fixed life of around ten years with possible extensions. Thus, the initial assumption is that private equity investments, and especially those made into start-up companies, are not meant to be traded as many other asset classes. Cumming and MacIntosh (2001a) suggest that some sales occur because the private equity fund approaches the end of its life cycle and thus investments must be liquidated in order to get some cash to be distributed to investors. These are called "fire-sales" as a private equity investor is obliged to sell its holdings although the project can be considered to be still in progress. If neither an IPO nor a trade sale is possible at that stage, a secondary sale may turn out to be the best alternative. The authors argue that secondary sales usually occur in situations where investments are floundering, which again suggests that the upside in returns is limited.

Cumming and MacIntosh (2001a) also hypothesize that there is a danger of bilateral agency problem because there is no guarantee that the relationship between the entrepreneur and the owner will work well. Also the fact that a secondary sale usually involves selling of the

private equity investor's shares, may be an indicative sign of a breakdown in the relationship between the entrepreneur and the current owner.

Nevertheless, during the last couple of years the number of secondary sales has increased rapidly, and apparently they have been gaining acceptance as viable exits. According to Thomson Venture Economics, in 2004 the number of secondary sales in the US more than doubled. The disclosed value of the transactions also more than doubled from $11.4 billion in 2003 to over $29 billion in 2004.

Marks and Walker (2006) represent the practioners' side and present several rationales behind secondary sales. One reason is claimed to be the form of payment. Private equity fund pays in cash while corporate buyers tend to favor stock. Stocks are much more illiquid than cash, and the private equity fund may need cash quickly. The liquidity of cash is also indirectly related to another reason for selling a portfolio company. Funds usually have fixed lifetimes, and therefore they must exit the investments when the termination date is approaching. This feature is stressed in many abovementioned academic studies as well. Secondly, a private equity company may also be in the middle of the process of raising a new fund and is thus obliged to show materialized returns. Third argument is related to privacy. Information about transactions between private equity funds is not disclosed anywhere.

Marks and Walker (2006), among many others, argue that increased fund sizes have eventually increased M&A activity. Although funds have growth, the number of potential targets does not grow at the same pace. This has led to a problematic situation where too much money is chasing too few deals resulting in higher valuations and competition over fewer targets. The same problem was discussed in an academic context by Gompers and Lerner (1999d). Lack of targets probably leads to increased amount of transactions between private equity companies as well.

3. Previous Studies and Related Theory

This chapter presents previous studies and the theoretical framework. The hypotheses presented in the next chapter are based on theories and assumptions presented in this chapter. To my knowledge, no prior academic research on the subject exists and thus the theoretical framework will be built in this chapter. The chapter consists of four separate, but related areas of private equity studies. These areas are risk and reward of private equity investments, exits, informational asymmetries, and the optimality of portfolio composition.

3.1. Risk and Reward Relationship

As known on the base of financial theories, risks can be divided into systematic and unsystematic components. Systematic risks arise from the overall economic conditions and are external to companies and industries. Unsystematic risks arise from firm, industry or other asset-specific effects. Unsystematic risk can be diversified away by constructing a diversified portfolio, leaving investor exposed only to systematic risks. According to capital asset pricing model (CAPM), financial markets reward only systematic risk with higher expected returns while exposure to unsystematic risk is not rewarded (Sharpe 1964). Therefore, only systematic risk should be considered and all unsystematic risks should be diversified away. These may be rational expectations for perfectly working capital markets.

However, the market for private equity investments is far from perfect. Not all investors necessarily have the same information, since unquoted companies are not obliged to disclose information like public companies. Investments are also highly illiquid, and cannot be sold at any time. This again increases riskiness, as there are no effective markets that would price the assets continuously. In addition, private equity investments are often long-term investments and are not even meant to be sold at any given time. The process of diversifying is costly and time consuming, and thus large amounts are often invested in single projects, which again increases the total risk level for an investor. (Manigart et al. 2001)

I mentioned above that private equity exists to finance projects and companies that cannot get financing otherwise. The discussed characteristics of private equity investments are usually the reasons for unavailability of financing. In other words, some companies have limited access to more traditional sources of capital. Gompers and Lerner (1999a) name four factors characteristics to private equity investments that limit access to capital for many companies. These factors are uncertainty, asymmetric information, the nature of firm's assets and conditions of financial and product markets.

Uncertainty arises from wider dispersion of possible outcomes. Young companies are associated with high level of uncertainty and that is why they may find difficulties when raising funding, as investors are reluctant to bear the risks arising from uncertainty.

Asymmetric information arises because people who are involved with the company's everyday operations know considerably more about the company's condition and prospects than investors, suppliers or strategic partners. For example, the entrepreneur may take actions that these stakeholders cannot observe. Asymmetric information may also lead to selection problem, which prevents the investors from distinguishing between competent and incompetent entrepreneurs, and between good and bad projects. This kind of a selection problem leads to situation in which an investor is unable to make efficient decisions about in which companies to invest.

The nature of company's assets affects company's financial and corporate strategy. A company with tangible assets such as machines or buildings may find it easier to get financing than a company with merely intangible assets. Increase in asset tangibility also increases financing duration and reduces monitoring intensity.

Conditions in the financial and product markets affect availability of financing. Fluctuations in capital markets arise from various reasons including changes in investors' perspectives and tax issues. Product market fluctuations reflect economic conditions and the level of competition. Additionally, market conditions affect private equity companies' performance through exit conditions.

These reasons, in addition to abovementioned illiquidity, explain most of the capital providers' unwillingness to take projects associated with a high level of risk. If informational

asymmetries did not exist, financing constraints to entrepreneurs would disappear. Gompers and Lerner (1999a) argue that in real world, venture capitalists can address these problems and are more skilled in finding promising investments than for example commercial banks. By scrutinizing companies before financing decisions and monitoring them afterwards, venture capitalists can better manage risks related to informational asymmetry and uncertainty. In many cases, venture capitalists not only provide capital but are also involved in managing the company and are helping the company to prosper by bringing in expertise in a specific business. Therefore, the nonpecuniary assistance is often critical to private equity investors' and to companies' success.

Obviously, nonpecuniary contribution to the entrepreneurial processes is often more important when the company is younger. Especially small unquoted companies are problematic as they are associated with a high level of company specific risk. Sahlman (1990) suggests that although venture capitalists allocate considerable amount of resources and time to monitoring portfolio companies, they still cannot completely remove all the uncertainties. Uncertainty is then logically reflected in a venture capitalist's required rate of return. Thus, rational venture capitalists look for projects that yield sufficiently corresponding to risk level. This usually means required returns above returns of more efficient markets.

Some observers argue that venture capital investments are primarily subjective assessments (Ruhnka and Young 1991). Therefore, a venture capitalist's own perception and preferences to risks determine required rate of return on investment. In this study, Ruhnka and Young discuss also the sources of risks in different stages. These results are often referred in literature. For example Gompers and Lerner (1999a) discuss the same features as Ruhnka and Young. The results of Gompers and Lerner (1999a) indicate that the sources of risks change to some extent as the company matures. When companies are young, risks are mainly internal to the company, while for mature companies risks are mainly external.

Manigart et al. (2001) report that investors actually require higher returns from early-stage companies. On average, private equity managers require a return between 36% and 45% for early-stage investments and between 26% and 30% for buyouts. However, these figures are based on a questionnaire sent to European private equity managers and do not represent the whole truth about the materialized returns.

Other factors affecting risk level include industry-related issues, geographical issues, legislative environment, political environment, and the size of an investment. Required returns should always depend on the riskiness of an investment, but they also vary according national markets. For example, higher returns will be required in a country with a high degree of political risk than in a more stable economy. Inflation rates, interest rates, and availability of funds also influence required returns. (Coyle 2000) The positive contribution of a good legal and economic environment to returns is also evidenced by Cumming and Walz (2004).

A study made by Chiampou and Kallet (1989) was probably the first serious attempt to empirically evaluate the actual risk level of venture capital investments. Their results suggest that venture capital investments would be less risky than commonly thought, which is somewhat surprising a result. However, the sample does not represent the whole private equity universe and moreover the study is already somewhat old, as the whole asset class has developed considerably during the last seventeen years. However, the study is not completely outdated as similar risk characteristics are reported in a study made by Cochrane (2003). He also suggests that smallest Nasdaq companies' risk profiles and thus required returns are similar to average venture capital investments. A bias-corrected estimation of the mean log return was 15%, which suggests that the equity risk premium can be somewhat modest.

Results of Cochrane (2005) suggest that different risk levels in different stages of business development actually materialize in required returns and later round investments are found to be less risky. This is in line with the assumptions related to the "J-curve" presented in the previous chapter (see Figure 2). Small and immature companies are more risky than large established companies with operational history. Cumming and Walz (2004) find evidence of the view that private equity investment managers add less value to later stage investments relative to earlier stage investments. This is also in line with the assumption that for later stage investments, when risks are mainly external (see Gompers and Lerner 1999a) and the company has perhaps already a relatively long operational history, the private equity investor's role is mainly to provide financing.

As previous studies have shown, the determinants of required rate of returns are ambiguous and thus valuing an unquoted company is always challenging. Valuation levels depend on various issues including both internal and external factors. The required return should change

only if there was a change in the outlook for a company or an industry in which the company is operating. Thus, expected increase in cash flows in an industry should be reflected in the required rates of return. Similarly, better prospects should improve the expected cash flows of all companies in an industry, no matter what their stage of business development is. (Gompers and Lerner 1999d) However, Gompers and Lerner show that valuation of private equity investments is also affected by the inflows to private equity funds and investment activity. If financial markets were perfect, inflows should not affect the valuation of companies. This means that as money begins to pour in, but the prospects of companies and the amount of companies remain unchanged, the competition for limited amount of investments tightens and so inflowing money increases valuation levels. The authors find evidence of this and show that doubling of inflows into venture funds increased the valuation levels from 7% to 21%. Doubling in public market values again led to between a 15% and 35% increase in the valuation of private equity transactions.

In conclusion, various abovementioned studies have found evidence of assumptions about dynamic risk levels corresponding to the stage of a company's business development. Accordingly, later stage investments seem to require less monitoring and scrutinising than early-stage companies. Therefore, the expected rate of return should be lower for later stage companies.

3.2. Exits

Exits have been a popular topic in private equity research but also somewhat challenging to investigate since disclosing performance is not mandatory for private equity companies. Nonetheless, exit and performance related discussions seem to maintain their popularity. Exit studies can be roughly divided into two segments. The first one is returns of private equity vs. returns of other asset classes. The other segment is comparison of returns and frequencies of different exit methods.

3.2.1. Performance of Private Equity Investments

In the previous section I discussed the risk profile of private equity investments. If the common belief is that private equity investments are more risky than other asset classes, then the investors should require higher returns. This sub section provides an overview of research related to performance of private equity investments.

Huntsman and Hoban (1980) show that the average return of a portfolio consisting of 110 investments was almost 19%. Eighteen of the investments were written off while seventeen yielded over 40%. Some researchers have measured the performance of private equity by investigating the yields of stock prices of publicly traded private equity companies. Martin and Petty (1983) report average rates of return of about 27% from 1974 to 1979. Ibbotson and Brinson (1987) report an average yield of 16% from 1959 to 1985. Schilit (1993) compares different asset classes and finds that mature private equity companies outperform other asset classes. His results are in line with the findings obtained by Chiampou and Kallet (1989). Their results show that during the period from 1978 to 1987, the average return on investment was 17.5%. They argue that venture capital investments are no riskier than small and medium sized publicly traded companies. On a default basis, mature venture capital funds were found to be slightly riskier than S&P 500 stocks. In addition, the results indicate that more established funds tend to outperform younger funds

Kaplan and Schoar (2003) show that venture capital funds weighted by committed capital outperform S&P 500 index while buyout funds do not. These results are in line with the findings of Jones and Rhodes-Kropf (2003) and Ljungqvist and Richardson (2003). Ljungqvist and Richardson show that private equity generates excess returns, net of carried interest and management fees of about five to eight percent per annum relative to the aggregate public equity market. For example, mature funds returned on average 19.8% net of fees, while S&P 500 during the same time period yielded 14.1%. Their analysis also suggests that the source of the outperformance is not necessarily compensation for systematic risk, but it may be related to the type of fund and the timing of the fund relative to the total number of funds. Of course, illiquidity of private equity investments should also be reflected in the

required rate of return. Thus, reported excess return can be argued to be compensating investors for illiquidity.

Ljungqvist and Richardson also show that private equity funds yield excess returns over their whole life time even on a risk adjusted basis. In addition, the authors suggest that as well as the timing of draw downs, capital returns are important factors in understanding private equity performance. The authors point out that it actually takes relatively long from a private equity company to invest all the committed capital, which affects negatively the performance of a fund. They show that it takes around six years to invest 90% of committed capital.

Exit behaviour varies among different types of funds. We can assume that such attributes as age, focus and size of the private equity fund affect performance. Kaplan and Schoar (2003) show that if a private equity fund outperforms the industry, the performance of the next fund will be solid as well. Moreover, well performing private equity investors are able to raise subsequent funds while poorly performing investors on average are not. First-time funds do not perform as well as higher sequence funds, which is an indication of gained experience. Venture capital funds seem to outperform buyout funds, which again is in line with the assumption that early-stage investments are more risky and should yield higher returns. Additionally, they show that funds that have been established in boom times are unlikely to raise follow-on funds. Larger funds have higher returns, but the relationship is concave, and thus when a fund becomes very large, performance tends to fall. Torstila and Laine (2005) also found that sole funds have significantly lower exit rates. They rationalize that poor performing managers are unable to raise subsequent funds.

Chiampou and Kallet (1989) show that mature funds gave a higher average return amounting to 24.4%. The investment focus of mature and younger funds was somewhat similar. The results of Torstila and Laine (2005) indicate similar performance. They found that several characteristics of funds may affect the exit rates of these funds. For example, they found that large funds outperform small funds and ones of large fund management firms outperform less known funds. The reputation aspect was also discussed by Megginson and Weiss (1991). They suggest that more reputed venture capitalists are able to raise funds more easily than less reputed ones.

Not all projects pay out. Private equity investors, and especially venture capitalists, make a considerable share of the total profits from the few "home runs" in their portfolios, which have traditionally represented around 10% of portfolio investments. A further 20% will be profitable but significantly less than those "home-runs". Around 10-30% will be written off and the rest fall into the category of "living dead" as they generate sufficiently profits just to keep the company running. (MacIntosh 1997; Gompers and Lerner 1999a; Cumming and MacIntosh 2001b).

3.2.2. Exit Methods

In the previous subsection I presented several studies that have found private equity investments outperforming other asset classes. Nevertheless, this is not the whole truth as the performance of a fund depends heavily on the methods of exits. Not all exit methods yield returns exceeding returns of other asset classes. Therefore, the choice of an exit method is critical.

Frequencies of different exit methods are discussed in many studies. Cumming and MacIntosh (2002) show that write-offs represented 29.5%, IPOs 26.8%, acquisitions 26.8%, secondary sales 8%, and buybacks 5.4% of the exits in the US during the sample period. Gompers and Lerner (1999c) report that for the period 1983-1994, 31% of companies completed an IPO, 29% were acquired, 19% were liquidated, and 21% were held private. Schwienbacher (2002) uses large self-collected dataset and reports the following exit frequencies in the US: IPOs 29.9%, acquisitions 30.3%, management buyouts 2.0%, secondary sales 5.0% and write-offs 32.8%. Torstila and Laine (2005) find 29% exit rate for IPOs and 23% for M&A transactions. The results are also in line with a study made by Schwienbacher (2002) and Gompers and Lerner (1999c).

The results of Das, Jagannathan, and Sarin (2003) indicate similar exit frequencies as abovementioned studies. Additionally, they suggest that the probability of an IPO-exit is 20%-25%, and moreover is fairly constant for all stages of business development. The probability of an acquisition exit is 10-20%, and the probability is higher for later stage

companies. Giot and Schwienbacher (2004) hypothesize that the initial assumption is that all companies will want to be exited through an IPO. They show that as the time passes, the probability of an IPO increases, but when a certain point in time is reached, the probability begins to decrease. A possibility of exiting through a trade sale extends the whole exit period making acquisitions the second best exit method. They also point out that venture capitalists are skilled in timing exits. During the times when valuations are high, the duration of investments tends to fall. They emphasize that exit decisions exhibit considerable dynamics and that monitoring durations and exit conditions is highly important for venture capitalists as they try to exit profitably all the investments in their portfolios.

The small number of abovementioned home-runs appears to be one reason for focusing on later stage financing. Although the profits are somewhat smaller, they are obtainable faster and from larger number of possible investments. Cumming, Fleming, and Scwienbacher (2003) report that venture capitalists tend to invest more in later stage projects when exit markets are liquid and shift to early-stage financing when exit markets become less liquid. This relates to the duration of investments. As exit markets become less liquid, venture capitalists want to postpone the obligation to exit and thus invest in early-stage companies for which investment durations are longer. The dynamics holds the other way around as well. When exit liquidity increases, venture capitalists want to accelerate the exit process and therefore invest in projects for which investment durations are shorter. These assumptions are in fact conflicting to some extent with the suggestions of Romain and Van Pottelsberghe de la Potterie (2004). They argue that cooling IPO markets result in greater activity in the buyout market.

Cumming and MacIntosh (2002) discuss various features that may have an impact on the choice of an exit vehicle. The authors hypothesize firstly that higher market/book ratios indicate higher quality of companies. This would rank exit vehicles in to the following order: IPOs, acquistions, secondary sales, buybacks and write-offs. They show that companies conducting IPOs actually have higher market/book-ratios. Gompers and Lerner (1999d) also conclude that performance of private equity company, and moreover, returns are directly related to the amount of IPO exits.

The second hypothesis of Cumming and MacIntosh suggests that the longer the duration of an investment, the more likely the investment will be exited through a secondary sale. This finding supports the "fire-sales"-hypothesis. However, their results suggest that longer duration has a negative effect on the likelihood of and IPOs relative to acquisitions and secondary sales.

Their data shows following annual real returns for different exit vehicles in the US: acquisitions 57.8%, IPOs 54.9%, and buybacks 34%. The returns were negative for secondary sales and write-offs. The total return accounting all exit vehicles in the US was 5.61%. The reason for IPOs ranking only second, may be the fact that IPO markets were not particularly active during the sample period (1992 - 1995). The surprising fact that buybacks become ranked ahead secondary sales may be explained by the small number of both type of transactions.

The most important result of the study is that IPOs are preferred means of exit for highly valued firms. This study, among many other studies, ranks the exit vehicles so that IPOs are considered to be the most desirable exit-method followed by acquisitions, secondary sales, buybacks and write-offs. Many other studies stress the importance and lucrative features of IPO exits as well. For example Gompers and Lerner (1999a) refer to Venture Economics study made in 1988, which showed that a $1 investment in a company that goes public returns on average $2.95 with an average holding period of 4.2 years. An acquisition method would return on average $1.40 over an average 3.7-year holding period. One additional aspect stressed by Cumming and MacIntosh (2002) is the importance of liquidity. Liquidity of an investment increases its value and thus increases a private equity investor's exit price. Therefore, private equity investors favour IPOs as they can get a price near to the latest transaction. IPOs provide the highest degree of liquidity, and moreover, higher returns than other exit methods. Gompers and Lerner (1999d, 1999d); Cumming and MacIntosh (2002); Schwienbacher (2003); Cumming, Fleming, and Scwienbacher (2003); Das, Jagannathan, and Sarin (2003); Torstila and Laine (2005)

Jeng and Wells (2000) suggest that IPOs are the strongest driver of venture capital investing in 21 countries represented in their study. Black and Gilson (1999) mention that US venture capital funds earn an average 60% annual return on investment in IPO exits and 15% in

acquisition exits, and that an efficient capital market is a prerequisite for an efficient private equity market. An active IPO market facilitates the private equity market. Their strongest argument is that since an IPO is the most profitable exit vehicle, it is thus the most favourable exit vehicle for both entrepreneurs and private equity investors. Furthermore, due to tempting returns, IPOs are also favoured by those who invest in the private equity funds. In order to raise follow-on funds and get the investors to provide additional capital in the future, the private equity investor has to be able to show sufficient returns. This again keeps the IPO market active as private equity investors have incentives to take portfolio companies public.

Schwienbacher (2002) points out that many results support the hypothesis that the possibility of going public provides additional incentives for entrepreneurs to improve performance. The hypothesis seems to explain the impact of monitoring devices on exit choice. Only the most promising ventures are taken public, while M&A transactions and their various forms seem to be more general exit routes. The reasons for these transactions are ambiguous. In many cases, the exit method depends on the quality of a portfolio company. For example, Schwienbacher (2003) suggests that companies exhibiting secondary sales and management buyouts are often less promising ventures. Cumming (2002) has conducted a same kind of a study on different exit routes. Neither Schwienbacher nor Cumming took into account the interaction between timing and exit method. Schwienbacher corrected this in 2004 and considered timing and particularly the impact of the IT-bubble. Needless to say that the bubble speeded up exits and made it easier for private equity funds to take companies public.

To sum up, academic research appears to consider IPOs as the most desirable exit route. Many abovementioned studies also stress the importance of an active IPO market. An active IPO market facilitates private equity investing. Acquisitions seem to be the next best alternative while secondary sales have gained little attention in general. Moreover, secondary sales are often considered as transactions involving less promising companies.

3.3. Informational Asymmetries

Informational asymmetries refer to a situation where an entrepreneur has informational advantage over investors. The private equity manager may be unable to observe the actions taken by the management of the company.

Agency problems in private equity finance are interesting, yet not very easily observable area of studies. Many of the studies appear to be limited to contracting or risk controlling and management. Relating to agency theory (Eisenhardt 1989), there are two recognizable approaches in risk control: the principal agent approach (Jensen and Meckling 1976) and the incomplete contract approach (Hart 1995). In the private equity context, the principal agent approach refers to using appropriate and comprehensive contracts. The incomplete contracting approach on the other hand refers to the private equity company's active involvement in the portfolio company's operations.

As already discussed above, small and young companies are typically associated with a higher degree of informational asymmetries than later stage companies. For example, Cornelli and Yoshi (1997) analyze the problem of "window-dressing" caused by the entrepreneur's tendency to manipulate short-term results. An entrepreneur may communicate a false picture about the condition of the company and this way keep investors on providing additional capital. Especially companies using high technology, such as software and biotech companies, are problematic for private equity investors.

One suggested solution to informational asymmetries is to choose suitable financial instruments for financing. Berglöf (1994) discusses the usage of convertible debt when contracting is incomplete and how the debt transfers control to the value-enhancing party. Hellman (1996) discusses the willingness of the entrepreneur to relinquish control rights by a trade-off between equity and debt induced incentives. Admati and Pfleiderer (1994) argue that a fixed fraction equity contract may give optimal incentives when it is rational to allocate the control rights to the private equity investor rather than to the entrepreneur. Trester (1998)

again suggests that the usage of preferred equity is one solution as share in the company gives more power in decision making.

Cumming and Walz (2004) show that close monitoring and the use of incentive compatible financial instruments, such as convertible bonds, contribute positively to returns. They focus on a venture capitalist's ability to add value. They show that higher intensity of monitoring and the use of control device (convertibles, syndication etc.) really contribute to internal rate of return. Removing informational asymmetries seems to benefit the entrepreneur. As a private equity investor's perception is not that diluted, he can use his expertise more effectively in advising the portfolio company.

Cumming and MacIntosh (2002) hypothesize that an exit vehicle is chosen, in part in addition to maximizing exit proceeds, to minimize informational asymmetry between company outsiders and insiders, and in particular between the private equity investor and the new owner. Moreover, the ability of the new owner to minimize informational asymmetry depends on the owner's identity. Informational asymmetries are greatest in IPO exits because buyers rely on intermediaries' and underwriters' pricing abilities. In addition, IPO markets can be highly cyclical, which means that valuations depend on the economic conditions and the general mood of investors in the stock markets. In acquisitions, the buyer is usually a strategic buyer and therefore has some bargaining power as he probably has expertise in the acquired company's business. This is why a buyer can demand access to inside information about the firm. In the case of secondary sales, the buyer's position is slightly less advantageous as there might be restrictions to inside information or same information may be provided to all possible buyers. Thus, informational asymmetries may not be completely removed, but they can be expected to be less severe

Informational asymmetries will be least severe in buybacks, where the entrepreneur repurchases the company's shares. However, buybacks typically involve a great amount of debt, which again means that after recapitalization, the debt holders are seriously exposed to informational asymmetries as the entrepreneur will now be the major shareholder. From the entrepreneur's viewpoint, through an IPO or a buyback, the entrepreneur regains some control while this is not the case with acquisitions. Transfer of control in the case of a secondary sale is less clear cut. In addition, the authors make an assumption that when projected marginal

cost constantly exceeds projected marginal value added, then the venture capitalist should have tendency to sell the company. However, this kind of a hypothesis is somewhat challenging to measure.

In their other study Cumming and MacIntosh (2001b) suggest that as long as informational asymmetries are sufficiently large, the venture capitalist is unable to sell the company at its real value. The venture capitalist is obliged to postpone the selling to a point in which at least some of the informational asymmetries are resolved. This indicates that longer investment duration is probably also associated with greater informational asymmetries. In addition, as I stated before, funds usually have a fixed life time, and thus acquisitions, secondary sales and buybacks are more likely to occur when the termination date approaches.

To sum up, the presence of informational asymmetries is apparent. As a solution to problems caused by informational asymmetries scholars have suggested optimal financial contracting and close monitoring.

3.4. Portfolio Composition and Fund Characteristics

The optimality of a portfolio composition and the size of a portfolio are undoubtedly highly important issues in terms of the success of a portfolio company and a private equity investor. For example, Sahlman (1990) has documented that venture capitalists' returns are directly related to the size of a portfolio. Related questions have also interested other scholars (Kanniainen and Keuschnigg 2001, 2003; Kaplan and Schoar 2003; Fulghieri and Sevilir 2005; Cumming 2006 etc.). The central aspect of these studies is whether private equity managers are diluting the value added to portfolio companies for example by increasing the size of a portfolio or by diversifying too much. Concequently, as can be assumed, there is a trade-off between portfolio size and the quality of managerial advice.

Kanniainen and Keuschnigg (2003) rationalize that although increasing the number of portfolio companies dilutes the value of the managerial advice provided by the venture capitalist, it might still be beneficial to hold a larger number of portfolio companies if they are related. In their companion paper published in 2001, the authors hypothesize that as long as

new investors do not enter the market, by increasing the size of the portfolio, private equity investors actually make portfolio companies more risky. This is based on the assumption that nonpecuniary aspects are the ones that make the actual distinction between private equity and pure lending. The authors' another assumption is that as new investors enter the market in the hope of sizeable returns earned by the current private equity investors, the supply of new capital eventually drives down the level of extracted rents. This makes holding a smaller portfolio and allocating the limited resources to fewer projects more beneficial and profitable for a venture capitalist. Private equity investors' rent extraction abilities are restricted and thus they will add more value by providing advice than when holding a larger portfolio.

Similar assumptions to those of Kanniainen and Keuschnigg are presented in a paper written by Fulghieri and Sevilir (2005). They assume that a venture capitalist enjoys having a large diversified portfolio because the probability that at least one of the portfolio companies will be successful increases. However, this again questions the venture capitalist's ability to add value. Their model suggests that if portfolio companies are related, a large focused portfolio is actually desirable. In other words, the degree of portfolio focus affects the trade off between a large and a small portfolio. According to their model, larger focused portfolios are desirable if the relatedness of portfolio companies is high. This is because it allows for reallocating resources from one start-up to another more effectively. Their model has many empirical implications. In addition to specialized venture capitalists, experienced and better skilled venture capitalists manage more focused portfolios. In contrast, less specialized venture capitalists manage larger funds and manage their portfolios more actively by disposing unprofitable projects. Better rent extraction abilities make larger and focused portfolios desirable because of increased incentives for a venture capitalist. Young start-ups are financed by venture capitalists with smaller portfolios, because they require more of a venture capitalist's resources.

Cumming (2006) suggests four categories of factors that determine the size of a portfolio: characteristics of a fund, characteristics of entrepreneurial firms, characteristics of financing arrangements, and market conditions. He found that independent venture capitalists have smaller portfolios than for example corporate and banking funds. The fund characteristics appear to be important determinants of portfolio size. He found that if a venture capitalist has more than two funds, the portfolios tend to be smaller. Funds that invest over a longer

duration and funds that raise more capital have larger portfolios. The results also suggest that the proportion of start-ups, expansion stage, turnaround, and high-tech investments affects portfolio size. More intensive investing in high-tech companies tends to decrease portfolio size. Investing dominantly in early-stage companies and life-science again seems to increase the size of a portfolio. Syndication and staging of investments seem to affect portfolio size implicating fewer companies in a portfolio when monitoring of portfolio companies is more intensive. Lastly, portfolios are larger when formed during boom times.

Ruhnka and Young (1991) studied portfolio formation in risk reduction context. They discuss detailed scrutinizing of the company and the concept of staged financing. The dependence on the stage of business development again means that a company will receive only a needed amount of financing at current stage. The third risk management measure discussed in the paper is portfolio management and diversification. Diversification can be done by diversifying across industries or across portfolio companies at different stages.

The results of Kaplan and Schoar (2003) indicate that larger funds, in terms of raised capital, outperform smaller ones. Torstila and Laine (2005) find similar evidence. However, Kaplan and Schoar notice that the relationship is concave and thus, when the fund becomes very large, performance tends to fall. Kaplan and Schoar found that better performing funds grow proportionally slower and in order to reduce dilution, better venture capitalists choose to stay small by limiting the amount of capital raised. Some empirical findings on actual portfolio composition are also presented in a study made by Ljunqvist and Richardson (2003). Buyout funds seem to invest in fewer companies than venture capital funds. This is the opposite of what many of the abovementioned studies suggest. In contrast, they do not find significant differences in industry concentration. Additionally, private equity funds seem to specialize more and give more weight to one industry than public equity funds. The results of Cumming and Walz (2004) suggest that larger portfolios, measured with the number of portfolio companies, are less optimal. They find that smaller portfolios actually outperform larger ones.

In a survey based study made by Manigart, et al. (2001), the authors asked private equity investors how long they expect the investment duration to be for a company in a specific stage of business development. The length of investment time is crucial in terms of portfolio formation because it affects performance. Early-stage companies are estimated to take on

average 6.16 years to mature, expansion stage companies on average 5.1 years, and buyout-stage on average 4.74 years. The authors also find weak support to the hypothesis that longer investment horizon decreases required rate of return.

As can been seen from abovementioned studies, scholars seem to agree that early-stage companies should be financed by a private equity fund with a focused portfolio. The optimal number of portfolio companies is debatable since increasing the number of portfolio companies can be considered to result in dilution in the value of managerial advice. On the other hand, if the value of managerial advice is neglible and the relatedness of portfolio companies high, it might be optimal to hold a large portfolio.

4. Research Problem and Hypotheses

This chapter formulates the research question and the hypotheses. The hypotheses are based on the theories and studies presented in the previous chapter. The purpose of the hypotheses is to find which fund characteristics may accelerate private equity secondary sales. My purpose is to investigate whether some common features can be found. First, I formulate the research problem and then I present the hypotheses.

4.1. Research Problem

I assume that the initial purpose of a private equity investment is to yield sufficiently to match its risk level. As can be interpreted from previous studies, scholars do not usually regard secondary sales as a meaningful exit route, because traditionally they have not been considered as very profitable transactions. For example, Cumming and MacIntosh (2002) suggest that non profitable or non promising ventures often exhibit secondary sales. A similar argument was made by Schwienbacher (2003). Torstila and Laine (2005) are also questioning the meaningfulness of secondary sales. They ask why another private equity investor should see a potential in a company their competitor is already trying to exit. As already mentioned, Gompers and Lerner suggest that IPOs are the most tempting exit vehicles. Therefore, I expect that private equity funds are always maximizing their profits and attempt to find the most profitable exit routes for all investments. Moreover, I assume that private equity funds do not invest in companies so that they can be sold later to the rivals.

I argue that it would be irrational behavior from a private equity investor to invest randomly in all kinds of companies and then dispose unprofitable holdings by writing them off or by selling them forward. This would be like tossing money around and hoping that at least some of them will pay out big time. Instead, I assume that private equity companies carefully select the companies to be invested in. Of course specialized funds', such as buyout or mezzanine

specialists, investment and exit strategies can be versatile, and therefore all these assumptions do not necessarily always apply to them.

However, the theory or assumptions related to private equity financing cannot explain the post-millennium surge in secondary sales. That is why I am now trying to find some factors that might be accelerating the selling process. In this study, I am concentrating on sellers' and acquirers' fund characteristics.

The research question can be formulated as follows: *Why do secondary sales occur, and which fund specific characteristics increase the probability of a secondary sale?*

To find answers to the research question, I am testing several hypotheses by comparing the sellers' and acquirers' funds. In order to evaluate the probability of a secondary sale, I run a regression model that is presented in the next chapter. The variables for testing hypotheses are also described in the following chapter.

4.2. Hypotheses

I am addressing the research question by testing several hypotheses that are formulated using the theory and the results of prior studies presented in the previous chapter. Hypotheses I, II, III, VI, VII and IX are tested by running a logit regression while other hypotheses are tested mainly by comparing the variables of sellers and acquirers.

4.2.1. Investment Period

The first testable factor is how much time passes between making the first and the last investment. This is based on an assumption that funds have a fixed lifetime and that it is probably optimal to select investments during the first years of the lifetime (Laine 2001). Ljunqvist and Richardson (2003) show that investing all committed capital can take relatively long. Additionally, assuming a fixed lifetime of a fund, a long investment period can be argued to have an adverse effect on performance. Funds that have longer investment periods

than average may not have enough time to develop their portfolio companies. Therefore, a long investment period supports the fire-sales hypothesis discussed by Cumming and MacIntosh (2001b). A long investment period can indicate that at the time when the parent company is raising a fund, the targets and the investment strategy are not yet clearly defined. A lack of targets may also result in longer investment period. Consequently, I hypothesize that the selling fund has been unable to find companies that could be exited through more traditional routes (i.e. trade sales and IPOs).

Hypothesis I: The probability of a secondary sale is directly related to the length of an investment period.

Additionally, I assume that sellers' investment periods are longer than those of other private equity funds. This would support *Hypothesis I.* However, investment strategies vary, and particularly for later stage investors, active portfolio management is nowadays common. Therefore the assumptions do not necessarily apply to all types of funds.

4.2.2. Experience

This hypothesis is based on the evidence that younger private equity investors have underperformed in relative to more mature ones. This is related to the experience of a private equity investor (Chiampou and Kallet 1989; Kaplan and Schoar 2003; Torstila and Laine 2005). I assume that since a seller considers a secondary sale as the best achievable exit method, it has been unable to exploit the potential of a target. Therefore, I assume that sellers are less experienced and the following hypothesis holds.

Hypothesis II: There exists an inverse relationship between the sequence number of the fund and the probability of a secondary transaction.

The mentioned studies have evidenced experienced investors outperforming less experienced ones. Private equity companies acquire knowledge and reputation as they age. The implication is that mature private equity companies are more skilled in selecting promising projects and managing them. The sequence number of a fund can also be considered as an

indication of a managing firm's reputation and experience as it has been able to raise a new fund (Kaplan and Schoar 2003).

In addition, follow-on funds have performed better than sole funds (Torstila and Laine 2005). Therefore, I assume that as the sequence number grows the fund has more skills in selecting investments and exit them more profitably.

Hypothesis III: A fund being new or sole fund, increases the probability of a secondary sale.

As a consequence of what is discussed above, an additional hypothesis can be formulated stating:

Hypothesis IV: The sequence number of a selling fund is below industry average.

One implication of this hypothesis is that acquirers' sequence numbers can be assumed to be larger than those of sellers'. This means that the acquirer is more skilled and experienced than the seller and is thus more capable of developing the target.

4.2.3. Fund Size

I test the size effect with three different variables: amount of capital, the number of portfolio companies and the average round investment. First I consider the amount of capital.

Hypothesis V: The acquirer is larger than the seller.

Many studies have evidenced that larger funds, in terms of capital, outperform smaller funds (see e.g. Chiampou and Kallet 1989; Schilit 1993; Kaplan and Schoar 2003; Torstila and Laine 2005). Larger funds can provide additional financing that cannot be provided by the seller. Additionally, their universe of possible investments is larger. In the case of secondary sales, I expect that the target requires more than what the selling fund can offer and thus the company would be better off in someone else's portfolio. Therefore, it is reasonable to expect that the acquiring fund is larger than the selling fund.

In addition, I assume that as the size of funds grows in general, the amount of rotation increases and thus the probability of a secondary sale increases. Therefore, I hypothesize that:

Hypothesis VI: Increasing the fund size increases the probability of a secondary sale.

If *Hypothesis VI* holds, acquirers can still be larger than sellers meaning that *Hypothesis V* is not automatically rejected, because I assume that as the industry develops, the funds attract more capital and the average fund size increases. This again can lead to more active trading of portfolio companies between private equity funds.

When the size of a portfolio is measured with the number of portfolio companies, increasing the size of a portfolio can be considered to have a negative impact on performance.

Hypothesis VII: The number of portfolio companies in the selling fund is larger than the average number of portfolio companies in a private equity fund and therefore, the probability of a secondary sale increases along with the number of portfolio companies.

This hypothesis is based on many of the models optimizing portfolio composition (Kanniainen and Keuschnigg 2003; Fulghieri and Sevilir 2005; Cumming 2006 etc.). In order to add value, the number of portfolio companies should be relatively small. The value of managerial advice and effort is diluted if the number of portfolio companies is increased. This relationship was evidenced by Cumming and Walz (2004).

The average round investment can also be considered as a proxy for a fund's investment strategy. I assume that large funds make larger average investments. Therefore, it is rational to assume that acquirers purchase assets from those who are making smaller investments.

Hypothesis VIII: The average round investment of the acquirer is above industry average.

This is a clear indication of the size of the fund. Smaller funds are probably incapable of providing the required amount of financing.

4.2.4. Reputation

This hypothesis relates to the assumption that selling funds are not managed by large reputed private equity companies. I assume that reputable private equity companies are able to exit their investments profitably while less known investors conduct more exits that are considered less profitable. The assumption is based on the evidence that funds managed by larger private equity companies outperform less known funds (Megginson and Weiss 1991; Torstila and Laine 2005).

Hypothesis IX: The amount of committed capital reported by the private equity firm is larger for acquirers than for sellers. Moreover, the more reputed private equity funds experience, less secondary sales. Thus having more capital under management has a negative impact on the probability of a secondary sale.

The amount of committed capital can be considered as a proxy for a private equity company's reputation, and furthermore ability to raise capital and new funds. If the company has a successful track record, some operational history, and the portfolio managers are known to be skilled, raising a fund is much easier than if the private equity company is unknown, does not have a solid track record, and long operational history.

4.2.5. Age

This is related to the fire-sales assumption and to the general practice of funds having a fixed lifetime (Cumming and MacIntosh 2002). When the termination date of a fund nears, the fund begins to exit investments in order to return money to investors. Private equity fund has to plan individual exit strategies for all investments. Then as the termination date approaches, the fund will rather exit its investments faster or at lower returns than experience write-offs. Thus, I expect that on average, selling funds are closer to their termination than acquiring funds.

Hypothesis X: The age of the selling fund at the time of a transaction is higher than the age of the acquiring fund.

The fund may have failed in selecting the right investments or it may have failed in exploiting potential of the portfolio companies, and it is therefore obliged to sell the company to someone who has the expertise, capital and/or skills to develop the company. The acquiring fund has still time left for developing the target before it must be exited.

4.2.6. Industry Concentration of a Portfolio

As I have already discussed, a private equity manager probably has expertise and knowledge on a specific industry. The knowledge is transferred to portfolio companies when the private equity company is holding a stake in a company. Therefore, private equity funds, and particularly venture capital funds, have often focused on a specific industry. It makes sense to hold a portfolio of related companies because the private equity investor has knowledge on that specific industry. If the private equity manager cannot provide any industry-specific advice or portfolio companies do not need it, then it makes sense to hold an effectively diversified portfolio. Otherwise, I assume that private equity investor's value added is diluted. This could be one explanation for occurrence of secondary sales. I expect that well performing private equity companies have clear industry focus while sellers diversify too much across various industries. I measure the industry concentration of selling and acquiring funds and hypothesize as follows:

Hypothesis XI: Sellers hold more diversified portfolios than acquirers.

This hypothesis is related to the composition of a portfolio (Kanniainen and Keuschnigg 2003; Fulhieri and Sevilir 2005 etc.). The private equity company has no expertise in the portfolio company's industry. Therefore, private equity company cannot provide anything else than financing, and thus, there will be no value added. In this case the portfolio company benefits more from belonging to another investor's portfolio.

Hypothesis XI is related to industry concentration while *Hypothesis VII* measures the number of portfolio companies. The industry concentration of a portfolio is measured by using Orris Herfindahl's index for industry concentration (Jacquemin and Berry 1979).

$$H = \sum_{i=1}^{n} P_i^2$$

In the formula P denotes for a specific industry's share of the whole portfolio. The index gets values between 0 and 1. Value 0 represents ultimate diversification and 1 represents focusing on just one industry. Therefore, I expect the sellers to get smaller values than acquirers, meaning that acquirers hold more focused portfolios.

5. Data

All the data used in this study are retrieved from SDC Platinum™ VentureXpert and Mergers and Acquisitions subdatabases at the Department of Accounting and Finance at Helsinki School of Economics. VentureXpert is provided by Venture Economics of Thomson Financial Securities Data and contains data on private equity industry worldwide from 1969 to present. At the moment VentureXpert is the single source for more comprehensive and detailed information on funds, private firms, executives, venture-backed companies, transactions, and limited partners. VentureXpert also serves as a source for fund performance, commitments, disbursements, and statistics. The Thomson Corporation is a leading data provider of integrated information-based solutions. VentureXpert has been used as a source of data in many previous private equity related studies (e.g. Gompers and Lerner 1999; Hege, Palomino, and Schwienbacher 2003; Das, Jagannathan, and Sarin 2003; Torstila and Laine 2005 etc.).

All data in VentureXpert are reported voluntarily and may thus suffer from reliability problems or be some way incomplete. This is because private equity companies are not required to disclose any information about their disbursements or performance. The data are gathered and updated by Thomson Financial.

In order to perform intended statistical analyses, I need data on sellers, targets and acquirers. This means that I need compositions of portfolios plus characteristics and focus of the selling and acquiring funds. Quantifiable attributes serve as independent variables in my statistical analysis.

I begin identifying secondary sales by searching venture backed M&A in VentureXpert. My time period is 1st January 1980 – 31st December 2006. A query with "venture fund acquired venture backed company"-flag returns 223 transactions of which 81 are usable, meaning that I am able to identify the target, the acquirer and the seller. The transactions are mainly US-based, but there are a couple of transactions taking place in Europe. I include only those deals where the acquirers have acquired a majority stake in the target. For the rest that cannot be used, the seller(s) is/are missing or information is just so incomplete that it is impossible to

use these transactions in my analyses. To gain more information on these transactions I retrieve transaction synopses for all transactions. For 98 transactions, the value of a transaction can be found. I provide a separate descriptive analysis of transactions using these 98 observations.

After identifying the transactions, I retrieve all needed data on selling and acquiring funds:

- Fund name
- Dates of the first and the last investments (investment period is calculated by subtracting the first day from the last day)
- Fund raising year
- Fund size ($Mil)
- Fund sequence number
- Fund investment type
- Fund type (private, investment bank etc.)
- Fund stage focus
- Number of portfolio companies
- Firm reported capital under management ($Mil)
- Fund's average round investment ($000)

In addition to these, I also retrieve names of the portfolio companies in each fund, which industries they represent and how much was invested in these companies.

Finally for testing my hypotheses, I retrieve the same fund characteristics for all private equity funds available excluding those used in my analysis. I remove outliers, incomplete observations or some other way suspicious observations. After performing all this I have 1135 funds of which all the needed attributes are available.

6. Empirical Analysis

This chapter presents the methods and results of my empirical examination. First I report and analyze descriptive statistics. In the first stage I also test statistical significance of possible differences between sellers' and acquirers' attributes. I use Student's *t-test* to reveal the possible statistical differences. In the second part of this chapter, I test hypotheses I, II, III, VI, VII and IX by running a logit regression. The purpose of using a logistic regression is to evaluate which fund characteristics contribute to the probability of a secondary sale.

6.1. Descriptive Statistics

6.1.1. Descriptive Analysis of Transactions

This section focuses on describing 98 transactions of which transaction value can be found. Due to unavailability of comprehensive transaction details, I have been obliged to draw conclusions on the basis of the scarce information available.

The transaction value ranges from $6.25 million to $2.78 billion averaging at over $386 million. The average size indicates that, on average, secondary sales are not small transactions. The standard deviation then again is quite large indicating that several types of transaction are included. My sample includes only those transactions where a majority stake was acquired. In this sample, around 26% of transactions were categorized as leveraged buyout transactions. It is possible that the percentage is larger, but I counted in only those that were mentioned in the synopses of transactions. The following table presents the descriptive statistics of transaction size.

Table 1. Transaction Value

The table presents descriptive statistics of transaction value.

	Mean	St Dev	Min	Max
Transaction value ($ Mil)	386.61	479.65	6.25	2 775.00
N	98			

The following table indicates the often referred post-millennium surge in the amount of secondary sales. During this period, interest rates have been at a historically low level, which has made borrowing tempting. Thus, it is not surprising that numerous post-millennium transactions are leveraged buyouts or contain debt-linked instruments.

Table 2. Periodical Distribution of Transactions

The table presents periodical distribution of transactions and average transaction values for each period.

Period	Observations	Average Transaction Value
1985-1989	2	83.55
1990-1994	4	233.89
1995-1999	30	413.09
2000-2004	29	318.39
2005-	33	486.68

The average transaction size has also grown considerably. This can be explained with the development of private equity industry, and moreover, increased average fund size.

The average fund size has experienced a considerable growth during the last 26 years. I already discussed this growth of funds in Chapter 2. and my data set implicates this growth. The average fund size in the data set has risen from $26 million in 1980 to over $900 million in 2005. The dramatic leap after year 2004 is due to a drastic increase in the average size of buyout funds. Figure 6 shows the development of average fund size accounting all the funds in the sample.

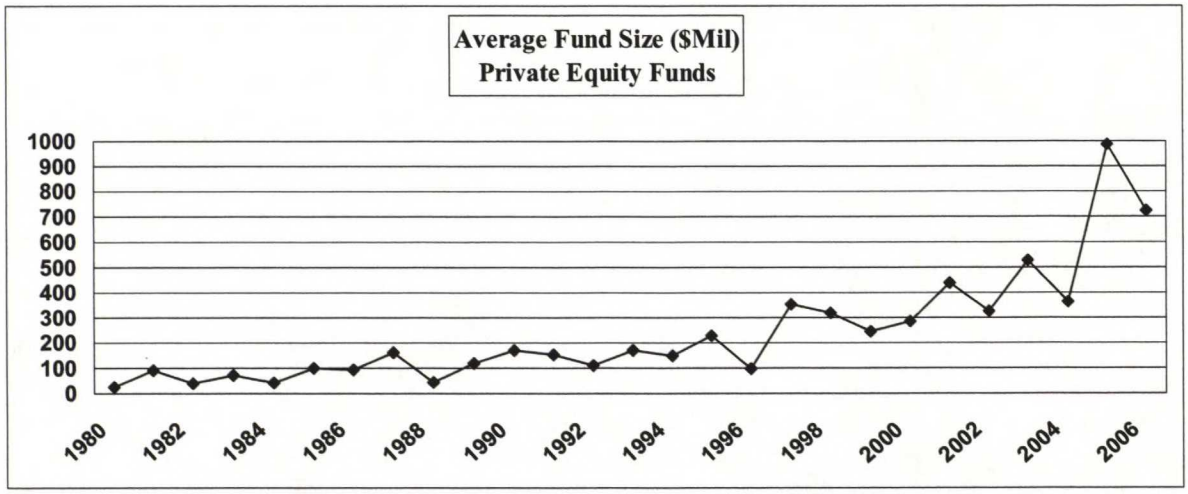

Figure 6. Development of Average Fund Size

The data has been arranged according to funds' initiation year. Rising fund sizes indicate increasing investment activity and thus it would be reasonable to assume that portfolio management activity and rotation increase as well.

Gompers and Lerner have examined closer factors affecting fundraising (see e.g. Gompers and Lerner 1999b). They found that external factors, such as GDP growth and taxation, affect significantly fundraising. The clearest evidence of this is the Employee Retirement Income Security Act of 1974 (ERISA). This clarification in rules governing pension fund investments has significantly increased commitments to funds. Additionally they show that internal factors affect fundraising significantly and thus pricing. Such internal factors include the size and the reputation of a private equity company. Reputation, referring here to the age and the size of the private equity company, is concluded to be affecting fundraising positively. Furthermore, Gompers and Lerner argue that increasing fundraising rises valuation levels and results in competition over the same investments.

The targets represent various industries although there appears to be concentration on specific categories, such as consumer related products and other products. Other products group includes all those companies that do not go under any other category. Therefore, businesses in this category are versatile. Table 3 presents the industrial distribution.

Table 3. Industrial Distribution of Transactions

The table presents industrial distribution of secondary sales and the mean values of all industries. The right column presents share of each industry.

Company Industry Group	Mean ($Mil)	% of Total
Biotechnology	736.30	1.90 %
Communications and Media	898.73	9.27 %
Computer Hardware	418.00	1.08 %
Computer Software and Services	14.00	0.04 %
Consumer Related	399.33	31.91 %
Industrial/Energy	547.29	19.75 %
Internet Specific	250.00	0.64 %
Medical/Health	440.73	12.50 %
Other Products	273.32	22.55 %
Semiconductors/Other Elect.	70.28	0.36 %
Total	37 114.16	100 %

The largest average transactions appear to involve companies focusing on communications and media, biotechnology, or industrial/energy related operations. Although consumer related is the largest group then followed by other products, the average deal size in these categories seems to be smaller. Thus, I assume that so called "mega deals" involve companies from more capital intensive industries.

The average age at the time of a transaction is presented in the following table.

Table 4. Age at the Time of a Transaction

The table presents descriptive statistics of target companies' age at the time of a transaction.

Variable	Mean	St Dev	Min	Max
Age	37.45	43.39	0.09	199
N	98			

The average age is very large and indicates that targets are certainly not early-stage companies. A closer examination reveals that the sample includes a couple of companies that were actually established initially over 100 years ago. Excluding companies that were over 50 years old, when the transaction took place, reduces the average age to 16 years. Nevertheless,

it still appears that on average these companies are not that young anymore. Thus, it is reasonable to assume that their needs are dissimilar to the needs of early-stage companies. They probably need more money and market expertise to expand their operations.

The sample used in my empirical examination consists of 81 transactions representing various industries. Due to incompleteness of data, I was unable to use all 98 above discussed transactions. Table 5 presents how the transactions are distributed throughout the time period used in this study. Although my time range begins in 1980, the first transaction does not appear in the sample until 1988. In this table I use VentureXpert industry minor groups as industry groups. The reason for using minor groups, instead of major groups, is that there are only three major industry groups: high tech., non-high tech., and medical/life science/health.

Table 5. Annual Distribution of Transactions

The table presents how the transactions in the sample are distributed across industries annually. SDC VentureXpert industry group refers to a target company's industry minor group.

	VentureXpert Industry Group									
Year	Communi-cations and Media	Computer Hardware	Computer Software and Services	Consumer Related	Industrial/ Energy	Internet Specific	Medical/ Health	Other Products	Semicon-ductors/ Other Elect.	**Total**
1988								1		1
1993					1					1
1994								1		1
1995	1			1	1			1		4
1996				2						2
1997				2				2		4
1998	1			3	1		1	2	1	9
1999				1	1					2
2000	1	1			1			1		4
2001				3	2		1			6
2002					1					1
2003		1		4	3			3		11
2004	1						2	2		5
2005	1		1	3	2		2	6	1	16
2006	1			2	3	2	2	4		14
Total	6	2	1	21	16	2	8	23	2	**81**

As can be seen, consumer related and other products have the largest frequencies. This is not particularly surprising since so many companies can be included in these categories. Industrial and energy related companies are also relatively well represented. One can also notice the increase in the amount of transactions after year 2000.

It is somewhat surprising that in this sample, the amount of computer software and internet specific companies is so small. I expected that there would have been more information technology and related companies in the sample.

6.1.2. Private Equity Funds

Different kinds of private equity funds tend to specialize in specific stages of business development. The following table presents how different types of private equity funds focus on specific stages.

Table 6. Distribution of Private Equity Funds' Stage Focus

The table presents the distribution of private equity funds' stage focus. Categories and definitions are the same used in SDC VentureXpert.

	Investment Type of a Fund						
Stage	Buyout	Fund of Funds	Generalist Private Equity	Mezzanine	Other Private Equity	Venture Capital	**Total**
Balanced Stage			10			246	256
Buyouts	310			1		3	314
Development						17	17
Distressed Debt	2				1		3
Early Stage			1			330	331
Energy					2		2
Expansion		1	1			93	95
Fund of Funds		30					30
Generalist	1		32			4	37
Later Stage	1		4			83	88
Mezzanine Stage				40		2	42
Other Private Equity					7		7
Real Estate					9		9
Recap	3						3
Secondary Funds		9					9
Seed Stage						51	51
Turnaround	6		1			1	8
Total	323	40	49	41	19	830	**1302**

By fund type, I refer to the investment type of a fund. In this study, I use the same definitions as Thomson Financial. This means that there are six possible investment types for funds: buyout, fund of funds, generalist, mezzanine, other, and venture capital.

Most of the funds are venture capital funds focusing on early-stage investments then followed by a balanced stage. The second largest group is buyout funds, and eventually, buyout funds focus mainly on buyout-stage. The category Other Private Equity appears to be somewhat vague a definition as it includes all the funds that do not go under any other group. Recapitalization is the smallest group if energy is excluded. However, it is reasonable to assume that funds specializing in some other stages also participate in recapitalization transactions. Similarly as venture capital funds tend to focus mainly on early and seed-stage financing, mezzanine funds' investments in other projects than mezzanine appear to be rare exceptions. Funds of funds invest dominantly in other private equity funds. To investigate more closely fund characteristics, I divide the funds according to fund types.

Table 7. Fund Types

The table presents fund types according to their investment type. Definitions are the same used by Venture Economics and in SDC VentureXpert.

	Investment Type of a Fund						
Fund Type	Buyout	Fund of Funds	Generalist Private Equity	Mezzanine	Other Private Equity	Venture Capital	**Total**
Investment Advisor Firm					1	5	6
Non Financial Corporation	4			1	2	57	64
Community Development Program						6	6
Evergreen Funds	1		3	1		9	14
PE Subsidiary of Other Financial Institution	27	2	6	7	5	87	134
State Program			1			3	4
Investment Bank Affiliate or Subsidiary	50	1	7	7	2	68	135
Direct Investor-Family Groups	2			1		4	7
Investors not classified						1	1
Direct Investor-Corporate Pension Fund						1	1
Independent Private Partnership	237		32	23	9	577	878
Public Venture Funds	1					4	5
Small Business Investment Company	1			1		3	5
Fund of Fund Partnerships		37					37
University Program						5	5
Total	323	40	49	41	19	830	**1302**

Private partnership venture capital funds represent over 44% of all funds in the sample. The second largest group is buyout funds structured as private partnerships. The second largest fund type after private partnership seems to be investment bank affiliates and subsidiaries, and followed by affiliates of other financial institutions. The amount of pension and other funds seems insignificantly small.

Table 8 presents descriptive statistics of all private equity funds' variables. The table reveals that there are large variations in all variables, which indicates versatility in investment strategies.

The average investment period, which refers to the period during which a fund invests, is five years. Over 90% of all funds have an investment period shorter than ten years. However, there are no sudden jumps in the investment period and the frequencies diminish steadily if we use five year intervals. In other words, the distribution has a long and thin right tail. This describes how private equity investing has evolved. Investment periods are nowadays shorter as the average indicates. Although most of the older funds that have long investment period are structured as limited partnerships, they do not have a fixed life like funds established during the last 25 years. There are several funds having investment period of 0 years, meaning that these funds have made all their investment at the same time.

Table 8. Descriptive Statistics of Private Equity Funds' Variables

The table presents mean, standard deviation, minimum value and maximum value of the sample for all independent variables in the left-side column.

Variable	Mean	St Dev	Min	Max
Investment Period	5.0	5.0	0.0	45.4
Fund Sequence No#	4.6	6.7	1.0	57.0
Fund Size ($ Mil)	301.8	765.5	0.1	10 100.0
Number of Portfolio Companies	12.8	19.5	1.0	403.0
Fund's Average Round Investment ($000)	3 725.1	50 243.9	0.2	1 799 846.4
Firm Reported Capital under Management ($ Mil)	10 193.5	40 524.6	0.1	1 100 000.0
N	1 302			

Fund size is $301.8 million on average. The deviation is quite large and the largest funds are over $10 billion. The largest funds are buyout funds, and the average is driven up by the large

number of large buyout funds. The average fund size of venture capital funds for example was $28.2 million.

The sequence number does not provide any mentionable information at this stage of the analysis. The average sequence number is 4.6.

The number of portfolio companies averages at 12.8 ranging up to as high as 403. The difference between the smallest and the largest fund is also quite large. The average round investment characterizes the traditional meaning of word venture capital and investing in early-stage projects, while the maximum round investment represents the nature of buyout stage investments. Private equity companies, specializing primarily in buyout funds, tend to be much larger, and thus, raise the maximum amount of capital under management.

6.1.3. Sellers

Characteristics of selling funds are of main interests in this study. In the next table, selling fund types are categorized according to their investment types.

Table 9. Characteristics of Selling Fund Types

The table presents fund types according to their investment type. Definitions are the same used by Venture Economics and in SDC VentureXpert.

	Investment Type of a Fund						
Fund Type	Buyout	Fund of Funds	Generalist Private Equity	Mezzanine	Other Private Equity	Venture Capital	**Total**
Investment Advisor Firm						1	1
Non Financial Corporation						1	1
PE Subsidiary of Other Financial Institution	5		1	3	1	3	13
Investment Bank Affiliate or Subsidiary	6		2	4			12
Direct Investor-Family Groups	1						1
Independent Private Partnership	53		3	6		11	73
Public Venture Funds	1						1
Fund of Fund Partnerships		2					2
Total	66	2	6	13	1	16	**104**

The amount of selling funds is greater than the total number of transactions, because due to syndication, some companies do not have only one seller. In other words, there may have been more than one fund holding noticeably stake in the target of a transaction.

It is somewhat surprising to find out that most of the sellers are buyout funds investing in buyout stage projects. This is not quite in line with the suggestion that secondary sales occur because the seller is immature and has not the required managerial expertise in the target's business. Other groups are relatively small compared to the buyout group. The second largest group is venture capital funds and the third is somewhat surprisingly mezzanine funds. However, mezzanine funds often finance short term projects and thus may be willing to sell holdings forward after the specific transactions is completed. Hence the reason to sell is probably unrelated to the private equity company's ability to add value.

Most of the funds seem to be structured as private partnerships. The second largest group is affiliates of financial institutions then followed by subsidiaries of investment banks. This information does not really provide any additional information since, as I discussed above, most of the private equity funds are private partnerships. Therefore, I cannot draw very specific conclusions on the basis of the available information. Descriptive statistics of variables for selling funds are reported in Table 10.

Table 10. Descriptive Statistics of Sellers' Variables

The table presents mean, standard deviation, minimum value and maximum value of the sample for all independent variables in the left-side column.

Variable	Mean	St Dev	Min	Max
Investment Period	6.7	4.1	0.0	23.0
Fund Sequence No#	5.1	6.2	1.0	37.0
Fund Size ($ Mil)	588.4	1 043.2	3.0	6 300.0
Number of Portfolio Companies	25.6	43.5	1.0	403.0
Fund's Average Round Investment ($000)	15 569.5	28 974.9	6.6	219 260.0
Firm Reported Capital under Management ($ Mil)	5 682.8	11 302.0	14.5	50 443.0
Fund Age at the Time of a Transaction	6.9	3.6	0.2	20.9
Industry Focus	0.40	0.21	0.16	1.00
N	104			

For sellers and acquirers, industry focus and a fund's age at the time of a transaction are also reported. These variables are presented, because they may have some explanatory power.

Investment period seems a bit longer than for private equity funds on average. Fund age at the time of a transaction is on average almost seven years, which is somewhat high if assumed that the fixed life of a private equity fund is usually something between eight to ten years (Gompers and Lerner 1999a). However, empirical evidence indicates that funds' lifetime can be quite much longer. For example Torstila and Laine (2005) report that in their sample the average life of a fund is 15.4 years.

As is characteristic to buyout funds, the average size of a fund is much larger than the size of private equity funds in general. The average sequence number 5.1 indicates maturity at least to some extent. Therefore, it may be unreasonable to assume that selling funds are managed by inexperienced managers who have not gained enough expertise and experience to successfully manage their holdings.

The number of portfolio companies is surprisingly high. This may be an indication of diluted managerial advice or then it just reflects buyout funds' role as financiers. The data includes three funds holding more than 100 portfolio companies. The maximum tops at 403 which can be considered as an outlier. Removing these three funds reduces the average to 19.8 and the standard deviation to 16.3.

Financing rounds are also quite large as the average round investment amounts to $15 569.5 million. The average round investment in the sample increases quite steadily.

6.1.4. Acquirers

The number of acquiring funds is smaller than the number of transactions. The reason for this is that the sample includes a fund that has been an acquiring party in more than one transaction.

It is not very surprising that the vast majority of acquirers are buyout funds. This leads to a conclusion at this stage of the analysis that secondary sales seem to be transactions taking

place primarily between buyout funds. This may be an indication of active portfolio management that is more common to buyout funds than to early-stage funds. The following table reveals that acquirers are primarily structured as private partnerships. At this stage this was already expected. Most the acquirers are buyout funds that are structured as private partnerships.

Table 11. Characteristics of Acquiring Fund Types

The table presents fund types according to their investment type. Definitions are the same used by Venture Economics and in SDC VentureXpert.

	Investment Type of a Fund						
Fund Type	Buyout	Fund of Funds	Generalist Private Equity	Mezzanine	Other Private Equity	Venture Capital	**Total**
PE Subsidiary of Other Financial Institution			1				1
Investment Bank Affiliate or Subsidiary	12		1			2	15
Direct Investor-Family Groups						1	1
Independent Private Partnership	55		1	1	1	3	61
Public Venture Funds	1						1
Fund of Fund Partnerships		1					1
Total	68	1	3	1	1	6	**80**

Further investigation reveals that 45% of acquiring private equity firms in the sample has announced leveraged buyouts as their preferred investment stage. Therefore, searching for investments from other private equity companies' portfolios could be part of an investment strategy. The other fund may be able to exploit the potential of a company that is currently held by an investor who is incapable of doing so. This is just one consideration and the issue requires further exploration.

The amount of different fund types reduces to six and the absence of many minor groups implicates that only specialists acquire companies from other private equity funds.

Descriptive statistics of variables are reported in Table 12. The investment period for acquiring funds appears to be a bit shorter than for selling funds. The same holds with fund age at the time of the transaction. The average number of portfolio companies is almost half of the average number of selling funds. In fact, it is close to the average of all private equity funds. The sequence number is somewhat higher than for sellers. This supports the

assumption that acquirers could be more experienced than sellers. The maximum sequence number goes up to 46.

Table 12. Descriptive Statistics of Acquirers' Variables

The table presents mean, standard deviation, minimum value and maximum value of the sample for all independent variables in the left-side column.

Variable	Mean	St Dev	Min	Max
Investment Period	5.0	4.2	0.0	22.8
Fund Sequence No#	6.1	8.1	1.0	46.0
Fund Size ($ Mil)	1 223.0	1 969.6	5.0	10 100.0
Number of Portfolio Companies	13.2	16.0	1.0	108.0
Fund's Average Round Investment ($000)	58 636.8	111 276.3	199.8	299 974.0
Firm Reported Capital under Management ($ Mil)	7 723.7	12 425.7	14.5	50 443.0
Fund Age at the Time of a Transaction	3.4	3.2	0.0	20.2
Industry Focus	0.4	0.2	0.1	1.0
N	80			

Acquiring funds, as well as private equity companies managing these funds, seem to be considerably larger than sellers. Furthermore, acquiring funds appear to be larger private equity funds in general. The average round investment seems to be considerably larger than for selling funds or other private equity funds. The average amount of capital under management indicates the presence of the well known and reputed buyout specialists (Bain Capital, Blackstone, Carlyle Partners etc.).

6.1.5. Comparison of Variables

I am particularly interested in the differences between acquirers and sellers. Are there some characteristics that differ significantly between these two? I compare the means of variables presented above to find indications of whether the formulated hypotheses are supported. I also compare sellers and acquirers to other private equity funds. The following table presents results of comparison of variables.

Table 13. Comparison of Variables

The mean of acquirers is compared to the mean of sellers. The means of sellers and acquirers are also compared to other private equity funds. Acquirers and sellers are excluded from other private equity funds when compared. The means are compared by using a two-tailed Student's t-test. z denotes for Wilcoxon nonparametric test for medians. Statistical significance at a 5% and 1% confidence level are indicated by * and ** respectively.

	Mean	*t*-stat	Median	z	St Dev	Min	Max
Investment Period							
Acquirer	4.97	**-2.86	4.39	**-2.37	4.21	0.00	22.84
Seller	6.74		6.22		4.15	0.00	23.01
All PE	4.99	0.03	4.13	-0.70	5.04	0.00	45.37
Acquirer	4.97		4.39		4.21	0.00	22.84
All PE	4.83	**-3.78	3.92	**-5.32	5.01	0.00	45.37
Seller	6.74		6.22		4.15	0.00	23.01
Fund Sequence No#							
Acquirer	6.08	1.07	3	0.63	8.09	1	46
Seller	4.96		3		6.08	1	37
All PE	4.46	*-2.09	2	*-2.41	6.56	1	57
Acquirer	6.08		3		8.09	1	46
All PE	4.58	-0.55	2	*-2.10	6.81	1	57
Seller	4.96		3		6.08	1	37
Fund Size ($ Mil)							
Acquirer	1223.00	**2.81	411.40	**2.97	1969.62	5.00	10100.00
Seller	588.40		247.50		1043.15	3.00	6300.00
All PE	243.71	**-11.43	60.80	**-7.85	578.18	0.10	8000.00
Acquirer	1223.00		411.40		1969.62	5.00	10100.00
All PE	287.65	**-3.81	63.00	**-7.33	753.05	0.10	10100.00
Seller	588.40		247.50		1043.15	3.00	6300.00
No# of Portfolio Companies							
Acquirer	13.23	*-2.43	7	**-4.18	15.95	1	108
Seller	25.64		16		43.52	1	403
All PE	12.84	-0.17	7	0.60	19.79	1	403
Acquirer	13.23		7		15.95	1	108
All PE	11.86	**-6.99	7	**-6.30	15.60	1	212
Seller	25.64		16		43.52	1	403
Fund's Average Round Investment ($000)							
Acquirer	58 636.84	**3.67	18 202.05	**4.15	111 276.28	199.80	299 974.00
Seller	15 427.84		6 253.35		29 083.92	6.60	219 260.00
All PE	8 339.99	**-9.42	1 882.70	**-7.62	38 383.75	0.10	1 100 000.00
Acquirer	58 636.84		18 202.05		111 276.28	199.80	299 974.00
All PE	10 294.74	-1.47	1 895.95	**-6.95	43 095.68	0.10	1 100 000.00
Seller	15 427.84		6 253.35		29 083.92	6.60	219 260.00
Firm Reported Capital under Management ($Mil)							
Acquirer	7 723.66	1.12	1 509.45	1.79	12 425.74	14.50	50 443.00
Seller	5 752.78		940.50		11 328.78	14.50	50 443.00
All PE	2 007.42	**-7.69	253.70	**-6.01	5 844.52	0.10	50 443.00
Acquirer	7 723.66		1 509.45		12 425.74	14.50	50 443.00
All PE	2 138.85	**-5.24	255.70	**-5.32	6 196.11	0.20	50 443.00
Seller	5 752.78		940.50		11 328.78	14.50	50 443.00
Age at the time of a transaction							
Acquirer	3.33	**-6.61	2.58	**-6.53	3.20	0.00	20.21
Seller	6.79		6.40		3.73	0.25	20.93
Industry Focus (Herfindahl index)							
Acquirer	0.43	0.79	0.37	1.56	0.24	0.14	1.00
Seller	0.40		0.34		0.21	0.16	1.00

Investment Period

Investment period is the window during which the fund makes disbursements. The seller's investment period is significantly longer than the acquirer's. It is also significantly longer than for private equity funds in general. Acquirers' average investment period is very close to the average of all other private equity funds.

Closer examination involved excluding all but buyout funds from the all private equity funds-group. Surprisingly, the average investment period for all buyout funds amounts to only 2.76 years which is even shorter than for all private equity funds. This result suggests that longer investment periods are characteristics to both sellers and acquirers.

The explanations for sellers' longer investment periods can be ambiguous. A longer investment period can be related to a specific fund's investment strategy meaning that the fund aims at active portfolio management and rotation during the whole life of a fund. This again would be an evidence of the current convergence of investment strategies of hedge funds and some private equity funds, which again is quite far from the traditional perception about venture capital and private equity investing. However, sellers' investment period being significantly longer supports the fire-sales hypothesis and thus *Hypothesis I* gets support.

Fund Sequence Number

Fund sequence number can be used as a proxy for experience or learning. As a private equity company matures and raises new funds, it acquires expertise and gains experience. Moreover, a higher sequence number indicates successful performance as the private equity company has been able raise subsequent funds. Therefore, it can be expected that the acquirers are more experienced and reputed than sellers. Nonetheless, no statistical difference can be found between acquirers' and sellers' average sequence numbers.

Acquirers' average fund sequence number is not significantly larger than seller funds' average sequence number. Only acquirers' average fund sequence is significantly larger than other private equity funds' average sequence at a 5% level. *Hypothesis IV* predicts that the average sequence of a selling fund is below the industry average. This assumption is not supported as the average sequence number of selling funds is actually larger than for other private equity

funds. This indicates that experiencing a secondary sale has little to do with experience, and it is difficult to draw conclusions on whether acquirers are more experienced than sellers. On the other hand, it can be argued that secondary sales occur between experienced investors.

Fund Size

Hypothesis V is supported as acquirers are significantly larger than sellers. The reason can be rationed by assuming that the selling fund cannot provide sufficiently funds to the company. Thus, the acquirer is a more suitable owner as it can provide required additional funding and expertise.

A reasonable assumption would be that one buyout fund acquires a later stage company, provides financing and advice, and then after a couple of years sells it to a larger buyout fund. The rationales behind this kind of a transaction could be that the target may have potential for stronger growth but requires additional financing and perhaps a larger market. A larger buyout fund may be able to provide more financing and be capable of materializing those stronger growth figures by providing access to larger markets.

Another aspect is performance. Larger funds have been found to be outperforming smaller funds (Chiampou and Kallet 1989; Schilit 1993; Kaplan and Schoar 2003), and therefore fund size could be used as one proxy for performance. This would be the case at least in those situations where the acquiring fund is buying assets at discounted values from the sellers. However, considering buyout funds' versatile investment strategies, poor performance is not necessarily an explanation of a secondary sale, and moreover, smaller funds are not necessarily underperforming in relation to larger funds.

Both acquirers and sellers are significantly larger than other private equity funds, which was also an expected result at this point. The majority of funds in the sample are venture capital funds, which eventually are smaller and make smaller disbursements than buyout funds.

Number of Portfolio Companies

As I already stated above, scholars seem to assume that increasing the number of portfolio companies dilutes private equity investors' ability to add value. This assumption is supported

by the data, and the difference between averages is statistically significant at a 5% confidence level. This was an expected result and thus *Hypothesis VII* is supported.

If all three selling funds that included more than 100 companies are removed, the average number of portfolio companies drops to 19.84 and the standard deviation to 16.3 resulting in a statistically significant difference in averages at a 1% level.

The average of selling funds' number of portfolio companies is also significantly larger than for all other private equity funds. Acquirers' average number of portfolio companies is very close to the average of other private equity funds' average. Removing outliers from the selling funds-group does not have an impact on the significance level of the difference when sellers and other private equity funds are compared. The difference of averages of sellers and other private equity funds remains statistically significant at a 1% level.

As *Hypothesis VII* predicts, sellers' value added can be considered diluted. Fund managers' resources are inelastic in a shorter period, and as the number of portfolio companies increases, the fund managers' time and effort are spread over larger number of companies.

As acquirers' average number of portfolio companies is relatively close to the average of other private equity portfolios, they can be argued to operate more efficiently than sellers. This can be turned the other way around by stating that sellers are forming their portfolios inefficiently. In my data sample, the average number of portfolio companies for buyout funds amounts to 11.2. Thus, the obtained result indicates that sellers really are financing a larger number of companies than private equity funds on average, and furthermore, buyout funds on average. The optimality of the number of portfolio companies is based on studies optimizing the composition of a portfolio (Kanniainen and Keuschnigg 2001, 2003; Fulghieri and Sevilir 2005 etc.).

It is somewhat surprising to notice that if the relationship between fund size and the number of portfolio companies is measured, the correlation is very low. For acquirers the correlation is 0.19 and for sellers as low as 0.06. For all private equity funds the correlation is 0.15 which can also be considered relatively low. It seems that there is no clear and consistent relationship between fund size and the number of portfolio companies.

Fund's Average Round Investment

Average round investment as a variable seems to make a very clear distinction between sellers and acquirers. *Hypothesis VIII* is supported as acquirers are evidenced to make larger investments than other private equity funds on average. The difference is also statistically significant at a 1% level when sellers and acquirers are compared. Sellers are also making somewhat larger investments than other private equity funds.

These results further support the idea that secondary sales are transactions taking place between buyout funds. The lower average round investment of all private equity funds can be explained with the large number of venture capital funds that eventually make smaller disbursements than larger funds.

The difference between acquirers' and other private equity funds' average round investment is noticeably although the acquirers' standard deviation is quite large. The size effect works here as well, and thus, we can expect that larger funds are more capable of providing necessary financing to targets of transactions.

Firm Reported Capital Under Management

Many private equity firms have various types of funds focusing on different stages of business development. A specific private equity company may have all kinds of funds ranging from seed stage funds to large buyout funds. My data set indicates that companies, whose funds are involved in secondary sales, are very large and thus can be said to be reputable. It is possible that these are companies that specialize only in buyout stage. On average, acquirers seem to be somewhat larger than sellers. However, the difference is not statistically significant. The minimum and maximum values are the same for sellers and acquirers because there are funds from the same company that have acted as sellers and acquirers.

Hypothesis IX suggests that acquiring private equity companies have more capital under management than sellers. This hypothesis gets some support although the difference in averages is not statistically significant. Acquirers and sellers are both larger, in terms of committed capital, than private equity companies on average.

Reputation of a seller does not seem to gain explanatory power. Both acquirers and sellers appear to be relatively established and reputed because they have been able to raise large amount of capital.

Fund Age at the Time of a Transaction

Age of a fund at the time of a transaction can be compared between sellers and acquirers. *Hypothesis X* suggests that because funds have usually a fixed life, it could be expected that the acquirer has more time to termination. This hypothesis is supported as the difference is statistically significant at a 1% level. Acquirers' average age amounts to 3.3 while sellers' average age is 6.8. Standard deviations are similar for both groups.

The average age of sellers cannot be considered extremely high if average life of a fund can rise to around fifteen years (Torstila and Laine 2005) or at least to over ten years (Gompers and Lerner 1999a). However, this again may be an indication of active portfolio management if fund managers begin to clean their portfolios already well before the termination date.

One critical consideration is that the acquirer has more time left to develop the target and to look for a suitable exit method. Selling to another private equity investor may be the best achievable solution for the seller. Possible reasons for this are that the target cannot be taken public or there is no strategic buyer for the company. On the other hand it is also possible that selling to another private equity fund is a better solution than selling to a strategic buyer.

Industry Concentration

I measure industry concentration with Herfindahl index. *Hypothesis XI* assumes that funds that are more focused outperform funds that diversify more across different industries. The hypothesis is not supported as industry concentration for sellers and acquirers appears to be quite similar.

On average; sellers and acquirers seem to diversify quite a lot as the both averages are below 0.5. However, the data includes some funds that concentrate on only one industry. Standard deviation is quite similar for both groups. As a conclusion, portfolio formation in terms of industry focus seems to be similar for both groups.

It is possible that industry focus would gain some explanatory power if most of the funds were venture capital funds or funds specializing in early-stage investments. But since most of the funds are buyout funds and because the importance of managerial advice and expertise can be even neglible in later stages, comparing industry focus of portfolios does not provide information about the reasons for selling.

6.2. Correlations

Correlations between independent variables are reported in the following table. The highest correlation exists between average round investment and fund size, which seems logical. Fund size is also relatively highly correlated with capital under management. This is also an expected result. The number of portfolio companies and the length of an investment period appear to be quite highly correlated as well. The negative correlation between fund sequence number and the length of investment period suggests that investment periods become shorter along with gained experience.

Table 14. Cross-correlations

The table presents Pearson's correlation coefficients between independent variables. Statistical significance at a 5% and 1% level is indicated by * and ** respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
(1) Investment Period	1.00**					
(2) Fund Sequence Number	-0.09**	1.00**				
(3) Number of Portfolio Companies	0.50**	0.04	1.00**			
(4) Ln (Fund Size)	0.01	0.27**	0.15**	1.00**		
(5) Ln (Fund's Average Round Investment)	-0.07*	0.17**	-0.04	0.62**	1.00**	
(6) Ln (Capital under Management)	0.14**	0.37**	0.20**	0.61**	0.44**	1.00**

Extending the investment period seems to reduce average round investment. A relatively high positive correlation between investment period and the number of portfolio companies together with negative correlation between investment period and average round investment gives a reason to hypothesize that as investment period becomes longer, a fund makes more

investments, which reduces the average round investment. Multicollinearity effects have been examined while running the regression.

6.3. Logit Regression

In order to deepen my analysis and to explain what factors may accelerate the occurrence of a secondary sale, I evaluate the probability of a secondary sale by running a logit regression. A binary choice regression is used to forecast the probability of something happens or not. Therefore, the outcome can be 0 = no secondary sale or 1=a secondary sale occurs. In this examination, selling funds get value 1 and other funds 0. The advantage of using logistic regression is that the maximum value is 1 while the minimum is 0. Otherwise, if a linear model was used, the probability could get values above 1 or below 0. Logistic regression uses a maximum likelihood estimation procedure rather than the least squares estimation procedure that is used in traditional multiple regression. This means that maximum likelihood approaches try to find estimates of parameters that make the data actually observed most likely.

The probability of an occurrence of an event can be calculated as follows:

$$P_i = \frac{1}{1+e^{-Z}}$$

Where Z is a function used in the model. Z is an ordinary linear function and is determined as follows:

$$Z = \beta_1 + \beta_2 X_1 + \beta_3 X_2 + ... + \beta_n X_{n-1}$$

Therefore the probability is determined as:

$$P_i = \frac{1}{1+e^{-\beta_1-\beta_2 X_1-\beta_3 X_2-...-\beta_n X_{n-1}}}$$

Furthermore, the marginal effect of Z on the probability of a secondary sale can be evaluated by a derivative of the above presented function with respect to function Z:

$$f(Z) = \frac{dp}{dZ} = \frac{e^{-Z}}{(1+e^{-z})^2}$$

Independent variables used in the regression analysis are the length of an investment period, fund sequence number, number of portfolio companies, fund size, average round investment and firm reported capital under management.

In addition to these, I test the effect of fund investment types. Buyout, Generalist Private Equity, Funds of Funds, Mezzanine and Other Private Equity funds are included as dummy variables in the model. Venture Capital serves as a benchmark group.

I also test *Hypothesis III,* more specifically to find whether fund sequence type has some effect on the probability. New and sole types are included as dummy variables and follow-on serves as a benchmark. As *Hypothesis III* suggests, new and sole variables are expected to have positive coefficients.

In order to eliminate problems caused by multicollinearity, I run four regressions with different specifications: background variables, stage focus, round investment type, and finally, a model with all variables.

Marginal effects of each variable are the main interests of the regression analysis in this study. Thus, I evaluate the possible impact of each variable on the probability by analyzing the marginal effects at the mean of all variables.

Fund size, average round investment, and firm reported capital under management include logarithmic transformation.

Table 15. Logit Regression

The table presents the results of Logit regressions with all variables and with variables remaining after backward elimination. In addition to the coefficients and student's t-values, the table reports estimations at mean values of the variables. The coefficients of the variables are multiplied by f(z). f(z) is a first order derivative of a probability function for occurrence of an event. Estimation results approximate the increase in the probability of a secondary sale along with a one point increase in a variable. Statistical significance at a 5% and 1% level are indicated by * and ** respectively.

	(1) Logit: Background Variables			(2) Logit: Stage Focus			(3) Logit: Round Investment Type			(4) Logit: Full Model		
Variable	β	t-stat.	βf(z)	β	t-stat.	βf(z)	β	t-stat.	βf(z)	β	t-stat.	βf(z)
Constant	**-4.6	-10.54		**-5.59	-11.99		**-5.69	-8.42		**-5.97	-8.49	
Reputation												
Ln (Capital under management)	**0.34	5.29	3.07 %							0.02	0.28	0.08 %
Fund Size												
Number of portfolio Companies	**0.02	3.52	0.15 %				**0.04	6.38	0.06 %	**0.03	4.75	0.12 %
Ln (Fund Size)				**0.23	2.81	3.82 %				0.09	0.83	0.35 %
Ln (Average round investment)							0.14	1.74	0.20 %	0.08	0.84	0.30 %
Experience												
New Fund dummy	-0.27	-0.91	-2.48 %				-0.40	-1.29	-0.58 %	-0.40	-1.26	-1.51 %
Sole Fund dummy	-0.19	-0.45	-1.73 %				-0.85	-1.81	-1.23 %	-0.81	-1.70	-3.05 %
Fund Sequence Number	**-0.04	-1.98	-0.38 %	-0.01	-0.55	-0.15 %	-0.03	-1.36	-0.04 %	-0.03	-1.38	-0.10 %
Investment Period												
Fund Investment Period				**0.09	4.97	1.56 %				*0.05	1.97	0.19 %
Fund Investment Type												
Buyout dummy				**2.48	7.26	40.85 %	**2.89	7.67	4.18 %	**2.85	7.41	10.79 %
Fund of Funds dummy				0.90	1.11	14.87 %	1.31	1.57	1.90 %	1.27	1.49	4.80 %
Generalist dummy				**2.05	3.83	33.73 %	**2.29	4.18	3.32 %	**2.32	4.18	8.77 %
Mezzanine dummy				**3.12	6.81	51.27 %	**3.57	7.46	5.17 %	**3.55	7.27	13.41 %
Other Private Equity dummy				1.25	1.15	20.52 %	1.53	1.40	2.22 %	1.59	1.44	6.03 %
Nagelkerke R^2	0.11			0.27			0.31			0.32		
Hosmer & Lemeshow	11.62			8.07			5.62			4.98		
N	1302			1302			1302			1302		
Parameters	5			8			9			13		

Odds are ratios of probabilities of an event occurring divided by probabilities of an event not occurring. Odds ratios can be calculated from coefficients of the regression model.

$$odds\ ratio = \frac{\pi}{1-\pi} = e^{\beta}$$

Where π is the probability of an event. Interpreting odds ratios of continuous or discrete variables is occasionally questionable, but it works well when interpreting the impact of dummy variables.

6.3.1. Results

Likelihood ratio and score test indicate that a better model could be obtained, but the model itself still works better than intercept-only null model. Hosmer and Lemeshow tests for goodness of fit suggest that models were fit to the data well. Nagelkerke R^2 can be considered high for specifications 3 and 4. The intercept itself does no tell anything about the probability of a secondary sale. However, as it gets statistically significant value, omitting it will yield more inaccurate results.

Reputation

Reputation measured by a private equity company's capital under management is also having a positive, yet insignificant, impact on the probability of a secondary sale. The impact is significant only in specification 1 where only so called background variables are examined. This is somewhat surprising, since I expected that less-reputed companies are less skilled and thus are unable to exploit the potential of portfolio companies. A positive impact suggests that experienced and reputable investors experience more secondary sales than those who are inexperienced and less reputable. The reason for the coefficient not being statistically significant in the full model can be partly explained by the high correlation with fund size. *Hypothesis IX* gets no further support and thus we cannot conclude whether reputation has negative or positive impact on the probability of a secondary sale.

Fund Size

Increasing the number of portfolio companies increases the probability of a secondary sale, and the coefficient is statistically significant in all specifications where included. In specification 4 the impact at the mean is 0.12% which can be considered small. This impact was already suggested in section 6.1 as the average number of portfolio companies for sellers

was almost twice as large when compared to acquirers or private equity funds in general. The coefficient remains significant in both models. As the models optimizing portfolio composition (Kanniainen and Keuschnigg 2001, 2003; Fulghieri and Sevilir 2005) suggest, optimally constructed portfolios include fewer companies. This is a rational assumption if the portfolio consists of early-stage companies. The optimal size of buyout portfolio again is less clear cut. Cumming and Walz (2004) among many others, suggest that private equity investors actually add less value to later stage companies than to early-stage companies. Therefore, it may be rational to hold a larger portfolio. Nevertheless, considering the large number of companies in sellers' portfolios, the results suggest that sellers' ability to provide to portfolio companies anything else than financing is questionable.

Although the average number of portfolio companies was significantly larger for sellers, the level of diversification was not. I measured this in sub-section 6.1.5. Considering this result, increasing the number of portfolio companies does not seem to result in increased level of diversification across industries.

Hypothesis VII, which assumed that increasing the number of portfolio companies result in dilution in the value of managerial advice, is supported as larger number of portfolio companies appears to have a positive impact on the probability. The impact is modest in all models. Since most of the sellers are buyout funds, I suggest that increasing the number increases rotation in portfolios and thus leads also to a larger number of secondary sales.

Increasing the fund size has no statistically significant impact on the probability if all variables are included. The impact is significant only in specification 2. However, the impact is positive, which indicates that increasing the fund size increase portfolio rotation as well. The odds ratio suggests that an increase in fund size increases the probability of a secondary sale rather than reduces it. In section 6.1. I reported selling funds to be significantly larger than other funds. Maximum likelihood regression does not seem to consider fund size as a significant variable until average round investment is omitted. A high correlation between these two variables causes a multicollinearity problem, and omitting average round investment and capital under management from the model is thus justified. In the reduced model the coefficient approximates 3.82% increase in the probability at the mean value. Hence, the reduced model finds supporting evidence of *Hypothesis VI,* and I conclude that

increasing the fund size probably increases investment activity as well, resulting in more active portfolio management.

Average round investment seems to have a positive, although not statistically significant, impact on the probability. As a consequence, I conclude that increasing the average round investment does not necessarily increase the probability of a secondary sale. A rational assumption would be that increasing the average round investment has a negative impact on the probability. This means that seller can provide sufficiently funds to the target, and thus, the target does not need a new financier. Due to high correlation between average fund size and average round investment, dropping average round investment from the model is justified.

Experience

Both fund type dummies indicate negative impact on the probability of a secondary sales although not statistically significant. In fact the results suggest that follow-on funds experience more secondary sales than new and sole funds. Odds ratios of both variables suggest that follow-on funds are more likely to experience secondary sales than new or sole funds. Consequently, *Hypothesis III* is not supported.

This result provides further support to the idea that being less experienced has less to do with the rationales behind secondary sales than previously thought. If most of the sellers are follow-on funds, then the private equity investor cannot be completely incompetent as he has been able to raise a subsequent fund. This again can be argued to be an evidence of acquired skills and competence, which would be aligned with the evidence of follow-on funds outperforming sole and new funds (Kaplan and Schoar 2003; Torstila and Laine 2005). In other words, being more experienced would actually increase the probability of a secondary sale. However, as I already reported, the coefficient is not statistically significant.

Fund sequence number seems to have slightly negative impact on the probability. This was expected although the coefficient becomes statistically significant only in specification 1. Low sequence number would have supported the hypothesis about the lack of experience. However, due to insignificance of the coefficient, I have no reason to assume that the coefficient would differ from zero.

As I already suggested in section 6.1. the seller being less experienced than the acquirer has probably little to do with the rationales behind secondary sales. Instead it is possible that numerous secondary sales occur between experienced investors who accept secondary sale as a viable exit method. The sellers' average sequence number was quite close to other private equity funds' average, while the acquirer's average sequence number was somewhat larger. This may be a weak indication that sellers are somewhat more experienced than others while acquirers really are more experienced than others.

To conclude, fund sequence number of a seller does not seem to have a significant impact on the probability, and thus, I find no support for *Hypothesis II.*

Investment Period

Extending the investment period appears to have a positive impact on the probability of a secondary sale. In both models 2 and 4 the null-hypothesis can be rejected. Odds ratio implicate only a slight increase in the probability of a secondary sale. At the mean value, adding one year increases the probability by 1.56% in specification 2 and 0.19% in specification 4.

In section 6.1., I already reported that sellers' average investment period is significantly longer than those of acquirers or other private equity funds. Now considering the results of the regression analysis it really appears that longer investment periods can explain the rationales behind secondary sales to some extent.

Ljunqvist and Richardson (2003) discuss the difficulties in investing all committed capital. If investments to the target company are made in the end of the investment period, the fund has less time to hold and develop assets because of the nearing termination date. Therefore, the fire-sales hypothesis (Cumming and MacIntosh 2001b) gets some support as all investments have to be exited before the termination of a fund.

Another more pragmatic rationale for longer investment periods could be the fund's investment strategy. Buyout funds investment durations can be considerably shorter than in the case of early-stage investments, and a fund's intention is not necessarily to hold assets as long as commonly thought.

I conclude that I find some evidence of *Hypothesis I*. Extending the investment period of a selling fund has a positive impact on the probability of a secondary sale.

Fund Investment Type

Buyout fund dummy's coefficient becomes statistically significant in all three specifications. This can be considered as an already expected result, since most of the funds in my data set are buyout funds. These kinds of investment strategies may well be characteristics to buyout funds. Impacts in all models become large implicating that a target owned by a buyout fund has a high probability of becoming sold to another private equity investor.

Mezzanine and Generalist dummies also indicate statistically significant impact. However, although these kinds of transactions may be characteristics to these funds, I consider obtained results somewhat suspicious due to small number of these funds in the sample. Fund of Funds and Other Private Equity dummies remain insignificant in all models.

6.4. Summary of Results

As a conclusion to my empirical analysis, this section reviews hypotheses presented in Chapter 4. and summarizes the main findings. Hypotheses I, II, III, VI, VII and IX are tested by running a logit regression and hypotheses IV, V, VIII, X, XI are tested by comparing the means of variables. Hypotheses are either rejected or supported. Table 16 presents the results and possible comments related to results.

Table 16. Summary of Results

Hypothesis	Supported	Comments
H1: The probability of a secondary sale is directly related to the length of an investment period.	Yes	Sellers' investment period was also found to be significantly longer while acquirers' average investment period was very close to other funds' average.

H2: There exists an inverse relationship between the sequence number of the fund and the probability of a secondary transaction.	No	Experience does not necessarily explain secondary sales.
H3: A fund being new or sole fund increases the probability of a secondary sale.	No	New and Sole fund dummies had a slight negative impact on the probability. Most of the selling funds were follow-on funds.
H4: The sequence number of the selling fund is below industry average.	No	The average sequence number was larger than for other funds.
H5: The acquirer is larger than the seller.	Yes	However, the result does not necessarily implicate better performance.
H6: Increasing the fund size increases the probability of a secondary sale.	Yes	This hypothesis is supported if the reduced model is used. Increasing fund size may result in more active portfolio management.
H7: The number of portfolio companies in the selling fund is larger than the average number of portfolio companies in a private equity fund, and therefore, probability of a secondary sale increases along with the number of portfolio companies.	Yes	Sellers' portfolios were almost twice as big as acquirers' or other portfolios.
H8: The average round investment of the acquirer is above industry average.	Yes	-
H9: The amount of committed capital reported by the private equity firm is larger for acquirers than for sellers. Moreover the more reputed private equity funds experience less secondary sales. Thus having more capital under management has a negative impact on the probability of a secondary sale.	Yes	Acquirers and sellers were both funds of significantly larger private equity companies than other private equity funds in general. Due to high correlation with fund size, the experience aspect is difficult to evaluate when running a regression.
H10: The age of the selling fund at the time of a transaction is higher than the age of the acquiring fund.	Yes	-
H11: Sellers hold more diversified portfolios than acquirers.	No	Industry concentration was found to be similar for both groups.

Other results	-	Most of the transaction occurred between buyout funds. Private partnership seems to be the dominant organizational form also among sellers and buyers. A fund being a buyout, mezzanine, or generalist fund increases the probability of a secondary sale significantly. Nonetheless, due to small number of mezzanine and generalist funds, making such judgments is questionable.

7. Conclusions

This thesis investigates private equity secondary sales and attempts to shed light on rationales behind them. The study also aims at finding fund characteristics that have an impact on the probability of a secondary sale. The empirical examination investigates 81 transactions involving 104 selling and 80 acquiring funds. The transaction size in the sample varies from around $6 million to over $2.7 billion. The impacts of fund characteristics on the probability of a secondary sale are estimated by running a logistic regression.

7.1. Findings

The results indicate that most of the secondary sales take place between buyout funds. Thus, a fund being a buyout fund increases the probability of a secondary sale. This implies that on average targets are not non-promising early-stage companies but rather more established companies. Most of the selling and acquiring funds are structured as independent private partnerships.

The study reveals that sellers have significantly longer investment period than acquirers or other funds. Therefore, extending the investment period appears to have a significant positive impact on the probability of a secondary sale. A longer investment period may be an indication of problems in investing all committed capital. On the other hand, considering the fact that funds typically have a fixed lifetime, funds may have to rush in exiting portfolio companies.

Selling funds are dominantly follow-on funds. Follow-on funds are evidenced to perform better than new and sole funds (Kaplan and Schoar 2003, Torstila and Laine 2005). Therefore, conducting secondary sales does not necessarily relate to underperformance of sellers. If learning and experience are considered, experience may actually increase the probability of a secondary sale. Nonetheless, in this study sequence numbers do not seem to gain explanatory

power, indicating that experience has possibly little to do with the reasons for selling a company to another private equity investor.

The findings suggest that acquiring funds are significantly larger than selling funds. This gives a reason for selling to assume that the target requires more financing than the selling fund can provide. Hence, increasing the fund size seems to increase the probability of a secondary sale. This may result from more active portfolio management if increasing fund size leads to increased rotation. The sellers are evidenced to finance significantly larger amount of portfolio companies, meaning that increasing the number of portfolio companies, increases the probability of a secondary sale. It can be assumed that larger number of portfolio companies is an indication of, or results in, more active portfolio management. Additionally, acquirers seem to make significantly larger average round investments than other funds.

In this study, fund management firms' capital under management is used as a proxy for reputation. For both sellers and acquirers, firm reported capital under management is significantly larger than for other funds. This means that most of the funds are funds of well known and reputed private equity companies. However, capital under management does not differ significantly between acquirers and sellers.

Selling funds appear to be significantly older than acquiring funds at the time of a transaction. Funds usually have a fixed lifetime, and thus when the termination date of the fund is approaching, the fund begins exiting its investments. A fund may have had problems in finding an optimal exit vehicle, and selling to another private equity investor may turn out to be the best solution. Longer investment duration can also relate to unsolved informational asymmetries as the private equity investor may have been unable to solve the actual value of the company.

Industry focus seems to be similar for acquirers and sellers. On average, neither of the groups seems to hold extremely diversified nor extremely focused portfolios.

7.2. Evaluation of the Study

The most considerable limitation to studying private equity investing relates to unreliability and lack of data. Private equity companies are not obliged to disclose information as those operating in public markets. Therefore, self collected or voluntarily reported data may be biased or incomplete, which again weakens the reliability of conducted studies. The unavailability of data may make measuring and quantifying specific matters impossible. Moreover, the unavailability of data results in using a lot of proxy variables, which again may affect validity of obtained results. Consequently, the author has to be careful about making generalizations on the basis of obtained results.

Validity of an indicator concerns the relationship between the concept investigated and the indicator. A valid indicator accurately reflects the concept measured. Reliability concerns the extent to which the measure yields the same results if the examination is repeated. The more consistently the procedure yields same results, the better the reliability. (Carmines and Zeller 1979)

In order to improve validity of this study, I have reviewed a wide range of prior studies and selected variables based on previous knowledge about the private equity industry. The same variables have been used in several prior studies (see e.g. Chiampou and Kallet 1989; Schilit 1993; Kaplan and Schoar 2003; Torstila and Laine 2005 etc.).

Reliability of this study is improved by describing the data, data source, methods and the whole research process in detail. Reliability is weakened by the possible bias in data. The data are reported voluntarily and may thus be incomplete or subjective. In addition, several parties collect data about same matters, so deviant results may be obtained if some other source of data is used.

7.3. Concluding Remarks and Suggestions for Future Research

So far secondary sales have not gained mentionable attention among academicians. Moreover, secondary sales have often been considered as transactions involving less promising companies and less competent private equity investors. To the author's knowledge, this is the first attempt to find reasons and rationales behind secondary sales, so the theoretical contribution of the study can be considered significant.

The initial assumption of the study was that sellers experiencing secondary sales are incompetent, less experienced, less reputed, or are some other way unable to exploit the potential of the target. Therefore, a better owner for the company can be found, and in the case of secondary sales, the better owner is another financial company. The findings of this study reject this initial assumption.

The results of this study indicate that secondary sales are primarily transactions taking place between buyout funds. Furthermore, the findings suggest that smaller buyout funds are selling companies to larger buyout funds. Considering the average size of a transaction, the average age of the targets, and the general stage focus of buyout funds, it appears that on average targets represent later stages of business development. Increase in the amount of secondary sales is also an indication of the development of the whole private equity industry. It seems to be nowadays more common that a portfolio company is "raised" to a certain stage in one fund and then sold forward to another fund which then takes the target to the next level. The target may not be ready to be sold to a strategic buyer. The acquirer then is capable of providing required additional financing and perhaps an entry to a larger market.

Another interesting aspect is that increased fund size probably results in increased M&A activity and also to increased amount of transactions between private equity funds. This is in fact, an indication of the existence of constantly developing secondary market for private equity investments. It is also reasonable to assume that although the average size of funds grows, the amount of possible targets does not necessarily increase as much. This was also evidenced by Gompers and Lerner (1999d). In addition, adding more companies to a portfolio

will eventually lead to more active portfolio management because all investments must be exited before the termination date.

It is also possible that to some extent secondary sales are a time dependent phenomenon. Post-millennium M&A activity, combined with an era of low interest rates and increased fund raising, can also explain the surge of secondary sales. These features are also evidenced by Cumming, Fleming, and Scwienbacher (2003) as well as Gompers and Lerner (1999d).

The results of this study support the fire-sales hypothesis discussed by Cumming and MacIntosh (2002). A high age at the time of a transaction and longer investment periods indicate that a fund has a hurry in exiting investments, because the termination of the fund approaches. The results also support the idea about the optimal composition of a portfolio (Kanniainen and Keuschnigg 2001, 2003; Fulghieri and Sevilir 2005). An efficiently formed portfolio probably includes fewer companies. However, I am unable to evaluate the actual performance of transactions, and thus, it is possible that a larger number of portfolio companies is related to a specific investment strategy. This study also contributes to the existing literature on exit methods (Gompers and Lerner 1999d, 1999d; Cumming and MacIntosh 2002; Schwienbacher 2003; Cumming, Fleming, and Scwienbacher 2003; Das, Jagannathan, and Sarin 2003; Torstila and Laine 2005 etc.).

The avenue for further studies is wide. Secondary sales and buyouts in general have gained significantly less attention than for example venture capital related topics. As transaction sizes keep growing, it is unreasonable to neglect the importance of these transactions to the surrounding economy.

First of all, the actual performance of secondary sales requires investigation. Due to the unavailability of data, this kind of analysis was impossible to include in this study. It would be interesting to see whether secondary sales are actually underperforming relative to other exit vehicles as is traditionally suggested. Investors investing in private equity funds are interested in seeing the return patterns of different transaction vehicles as the results may affect their decisions whether or not to invest in funds of a specific private equity firm.

The performance of funds conducting secondary sales and comparison of fund types' performance would be an interesting research topic. This kind of comparison would reveal the differences in performance and transaction characteristics between different fund types.

It would also be interesting to follow the journey of a specific company from portfolio to another and see whether private equity is capable of making the company to prosper and whether the company benefits from being sold from a portfolio to another. More specific investigation of targets and their performance in the long term would also be vital.

This topic also requires a thorough transaction focused investigation. A detailed investigation of transactions would include studying the structuring of transactions, in addition to financial instruments and contracts used in these transactions. This kind of study would reveal the characteristics of different transactions. Hence, the results would help practioners in planning the optimal structure of a transaction.

References

[1] Admati, A.R., Pfleiderer, P., 1994, "Robust financial contracting and the role of venture capitalists", Journal of Finance 49, 371-402

[2] Baygan, G., 2004, "Venture capital: trends and policy recommendations, OECD micro policies for growth", the synthesis paper for venture capital peer reviews, Available at: www.oecd.org/sti/micro-policies

[3] Berglöf, E., 1994, "A control theory of venture capital finance", Journal of Law, Economics and Organization 10, 247-267

[4] Black, B.S., Gilson, R.J., 1999, "Does venture capital require an active stock market?", Journal of Applied Corporate Finance 11 (4), 36-48.

[5] Carmines, E. G., Zeller, R. A., 1979, "Reliability and validity assessment", Sage Publications, Beverly Hills CA.

[6] Cassidy, J., 2002, "Dot.con: the greatest story ever sold". Allen Lane. UK

[7] Chiampou, G.F., Kallett, J.J., 1989. "Risk & return profile of venture capital", Journal of Business Venturing 4, 1-10

[8] Cochrane, J.H., 2005, "The risk and return of venture capital", Journal of Financial Economics 75, 3-52

[9] Cornelli, F., Yosha, O., 1997, "Stage financing and the role of convertible debt", Working Paper, London Business School, Available at http://faculty.london.edu/fcornelli/venture.html

[10] Coyle, B., 2000, "Venture capital & buyouts", Glenlake Publishing Company, Chicago IL

[11] Cumming, D. J., 2006, "The determinants of venture capital portfolio size: Empirical Evidence", Journal of Business, Vol. 79, 1083-1126, Available at SSRN: http://ssrn.com/abstract=261747

[12] Cumming, D., Fleming, G., Scwienbacher, A., 2005, "Liquidity risk and venture Capital Finance" Financial Management, 34, no 4

[13] Cumming, D., Macintosh, J., G., 2001a, "The extent of venture capital exits: evidence from Canada and the United States", Available at SSRN: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=250519

[14] Cumming, D., Macintosh, J., G., 2001b, "Venture capital investment duration in Canada and the United States", Journal of Multinational Financial Management 11, 445-463.

[15] Cumming, D., Macintosh, J., G., 2002, "Venture capital Exits in Canada and the United States", Available at SSRN: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=218353

[16] Cumming, D., Fleming, G., and Schwienbacher, 2003, "Liquidity of exit markets and venture capital finance", Financial Management, Vol. 34, No. 4, Available at SSRN: http://ssrn.com/abstract=840810

[17] Cumming, D., Walz, U., 2004, "Private equity returns and disclosure around the world", Available at SSRN: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=473341

[18] Eisenhardt, K.M., 1989, "Agency Theory: an assessment and review", Academy of Management Review 14 (1), 57-74

[19] Ewing, J., 2004. "Beware of these buyouts – Private equity firms are buying other firms' buyouts", Business Week, The McGraw-Hill Companies October 25. 2004, Referred on 15.7.2006, Available at: http://www.businessweek.com/magazine/content/04_43/b3905152_mz035.htm

[20] Fenn, G.,W., Liang, N., Prowse, S.(1998), "The private equity market: an overview", Financial Markets, institutions & instruments 6(4): 1-106.

[21] Fulghieri, P., Sevilir, M., "Size and focus of a venture capitalist's portfolio" (February 28, 2005). Available at SSRN: http://ssrn.com/abstract=630441

[22] Giot, P. Schwienbacher, A., 2004, "IPOs, trade sales and liquidations: modelling venture capital exits using survival analysis", EconWPA 0312006.

[23] Gompers, P., Lerner, J., 1999a, "The venture capital cycle", MIT press, Cambridge MA

[24] Gompers, P., Lerner, J., 1999b, "What drives venture capital fundraising?" NBER working paper 6906

[25] Gompers, P., Lerner, J., 1999c, "The determinants of corporate venture capital success: organized structure, incentives and complementaries". NBER working paper 6725

[26] Gompers, P., Lerner, J., 1999d, "Money chasing deals? The impact of fund inflows on private equity valuations". Journal of Financial Economics 55, 281-325.

[27] Hart, O., 1995, "Firms, contracts, and financial structures", Oxford University Press, Oxford

[28] Hellman, T., 1997, "The allocation of control rights in venture capital contracts", Rand Journal of Economics 29, 57-76

[29] Huntsman, B., Hoban, J.P., 1980, "Investment in new enterprise: some empirical observations on risk return and market structure", Financial Management 9(2), 44-51

[30] INVESCO sector spotlight, 2004, Review of The European Buyout Market.

[31] Jacquemin, A., Berry, C.H., 1979. "Entropy measure of diversification and corporate growth", The Journal of Industrial Economics 27, No 4, 359-369

[32] Jeng, L., Wells, P., 2000, "The determinants of venture capital funding: evidence across countries", Journal of Corporate Finance 6, 241-289.

[33] Jensen, M.C., Meckling, W.H., 1976, "Theory of firm, managerial behavior, agency costs, and ownership structure", Journal of Financial Economics 3(4), 303-360

[34] Jones, C., Rhodes-Kropf, M., 2003, "The price diversifiable risk in venture capital and private equity", Working Paper, Columbia University.

[35] Kanniainen, V., Keuschnigg, C., 2001, "Start-up Investment with scarce venture capital support", CESifo Working Paper Series No. 439, University of St. Gallen Dept. of Econ Discussion Paper No. 2001-04, EFMA 2001 Lugano Meetings

[36] Kanniainen, V., Keuschnigg, C., 2003, "The optimal portfolio of start-up firm in venture capital finance", Journal of Corporate Finance 9, 521-534.

[37] Kaplan, S., Schoar, A., 2003, "Private equity performance: returns, persistence and capital Flows", Working Paper 446-03, MIT Sloan School of Management.

[38] Laine, M.L.S., 2001, "What drives the IPO exit rate of venture capital funds? Evidence from liquidated U.S. funds." Master's thesis, Helsinki School of Economics.

[39] Lee, A. SW., 2003, "Private equity secondary funds and their competitive strategies", INSEAD

[40] Ljundqvist, A., Richardson, M. (2002), "The cash flow, return and risk characteristics of private equity", Working paper, New York University. NY

[41] MacIntosh, R. 1997, "Venture capital exits in Canada and the United States", In Halpern, P.J.N.(Ed.), Financing Growth in Canada, University of Calgary Press, Calgary AB, pp 279-356.

[42] Manigart, S., De Waele, K., Wright, M., Robbie, K., Desbrières, P., Sapienza, H.J., Beekman, A., 2001, "Determinants of required return in venture capital investments: a five country study", Journal of Business Venturing 17 , 291-312

[43] Marks, R., Walker, B., 2006, "Pros and cons of secondary private equity buyouts", McGuireWoods, Referred on 15.2.2007, Available at: http://www.mcguirewoods.com/news-resources/publications/corporate_services/private_equity_0506.pdf

[44] Martin, J.D., Petty, J. W., 1983, "An analysis of the performance of publicly traded venture capital companies", Journal of Financial and Quantitative Analysis 18, 401-410.

[45] Mayer, C., Schoors, K., Yafeh, Y., 2005, "Sources of funds and investment activities of venture capital funds", Journal of Corporate Finance 11, 586-608

[46] Megginson, W.L., Weiss, K.A., 1991, "Venture capitalist certification in initial public offerings", Journal of Finance 46, 879-903

[47] Peng, C.Y.J., Lee, K.L., Ingersoll, G.M., 2002, "An introduction to logistic regression analysis and reporting", The Journal of Educational Research 96, No. 1

[48] Romain, A., Van Bottelsberghe de la Potterie, B., 2004, "The determinants of venture capital: a panel data analysis of 16 OECD countries", Solvay Business School Working Paper CEB 04/015

[49] Ruhnka, J.C, Young, J.E., 1991. "Some hypotheses about risk in venture capital investing", Journal of Business Venturing 6, 115-133

[50] Sahlman, W., 1990. "The structure and governance of venture capital organizations", Journal of Financial Economics 27, 473-521

[51] Schwienbacher, A., 2002. "An empirical analysis of venture capital exits in Europe and in the United States", Unpublished working paper, University of Namur. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=302001

[52] Sharpe, W. 1964. "Capital asset prices: A theory of a market equilibrium under conditions of risk", Journal of Finance 19, 425-442

[53] Schilit, K., W., 1993, "A comparative analysis of the performance of venture capital funds, stocks, bonds and other investment opportunities", International Review of Strategic Management 4, 301-320

[54] Sheahan, M., 2005, "Portfolio for sale", Venture Capital Journal, Venture Economics, Available at: http://www.ventureeconomics.com/vcj/protected/1110466090915.html

[55] Sohl, J.E., 2003, "The US angel and venture capital market: recent trends and developments", Journal of Private Equity, Vol. 6, No. 2, 7-17

[56] Trester, J.J., 1998, "Venture capital contracting under asymmetric information", Journal of Banking and Finance 22, 675-699

[57] Trumbull, M., 2006, "Are private buyouts good for the economy?", Christian Science Monitor 13.11.2006, Referred on 17.02.2007, Available at: http://www.csmonitor.com/2006/1113/p01s01-usec.html

[58] Zalan, T., 2004, "The secret multinationals of the new millennium: internationalization of private equity firms", Journal of International Business Studies, October 2004

[59] Vanac, M., 2006, "Private equity in the spotlight", The Plain Dealer, 19.11.2006, Referred on 1.3.2007, Available at: http://www.morgenthaler.com/content/Buyouts/Articles/Articles%20documents/Plain%20Dealer%2011-19.pdf

[60] Werdigier, J., 2007, "Private equity firms try to buff image in Europe", International Herald Tribune, 5.3.2007, Referred on 2.3.2007, Available at: http://www.iht.com/articles/2007/03/05/business/equity.php